GOVERNMENT OF INDIA

MINISTRY OF COMMERCE AND INDUSTRY

सत्यमेव जयते

REPORT

OF THE

COMMITTEE

ON

ELECTRIC FURNACES, STEEL FOUNDRIES

AND

STEEL RE-ROLLING MILLS

(APRIL 1957)

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INTRODUCTION

APPOINTMENT OF THE COMMITTEE

On the 11th of April, 1956, the Government of India in the erstwhile Ministry of Commerce and Industry issued a Press Note [Appendix I(a)] inviting applications for licences under the Industries (Development and Regulation) Act, 1951, from parties interested in the installation of steel re-rolling mills. This was based on the assumption that reasonable quantities of raw materials might become available towards the end of 1959.

On the 30th April 1956, the Government of India issued a fresh resolution on their industrial policy in which, *inter alia*, stress was laid on regional industrial development. Meanwhile, a review was made of the anticipated availability of raw materials for steel re-rolling mills and electric furnaces. From this review, it was evident that the scope for the establishment of new capacity could not but be limited. Another Press Note [Appendix I(b)] was, therefore, issued by the Government of India on June 6, 1956, drawing the attention of the interested parties to the revised Industrial Policy Statement and to the considerations which would be taken into account in licensing further capacity.

2. In response to these Press Notes, a large number of applications were received for licences—

(a) to establish new units;

(b) to effect substantial expansions in the existing units;

(c) to carry on business; and

(d) to enlarge the scope of industrial units already registered or licensed under the Industries (Development and Regulation) Act to provide for the manufacture of additional items pertaining to the Iron and Steel Industry.

From these, it was clear that the problems of the steel re-rolling industry, electric furnaces and steel foundries should be co-ordinated with the development taking place in other sectors having regard to their economics, the expected availability of raw materials by 1960/61 and regional considerations. The then Ministry of Commerce and Industry, therefore, issued a Resolution No. I. & S. (B)-55(7)/56, dated 24th July, 1956, in the *Gazette of India Extraordinary* of the same date, appointing a Committee to examine and report on the problems broadly referred to above. The Committee was composed of the following:—

(1) Shri B. B. Saksena, Joint Secretary, Ministry of Commerce and Industry· *Chairman.*

(2) Shri S. Sambasivan, Tata Iron and Steel Co., Ltd.—*Member.*

(3) Shri R. M. Agrawal, Mukand Iron and Steel Works Ltd., Bombay—*Member.*

(4) Shri D. P. Dada, Shri Maharaja Steel Mills Ltd., Kapurthala—*Member.*

(5) Shri K. S. Raghupathi, I.A.S., Deputy Secretary, Ministry of Iron and Steel—*Member.*

(6) Shri S. Banerjee, Deputy Iron and Steel Controller—*Member-Secretary.*

The Resolution is reproduced in *Appendix II.*

3. We reproduce below for facility of reference the terms of reference.

"The Committee will—

(a) study the raw material requirements of the existing electric furnaces, foundries and re-rolling mills in the country and assess the kind of expansion that is possible having regard to the availability of the raw materials in the future;

(b) suggest ways and means of improving the efficiency of these units and recommend steps that should be taken to make them economic and independent of any form of subsidy in regard to the prices at which they obtain their raw materials;

(c) assess the additional capacity that it may be desirable to set up in the light of the developments which are taking place in other sectors of the economy and the considerations set out in (a) and (b) above;

(d) indicate suitable locations for the new units that may be set up having regard to the importance of promoting regional development and other relevant considerations such as transport facilities and raw materials supplies; and

(e) formulate principles which should govern the examination of the applications for setting up re-rolling mills which have been received in response to the Press Note of the 11th April, 1956."

Previous enquiries

4. The Steel Re-rolling Industry, Electric Furnaces and Steel Foundries are dependent on raw materials from outside sources—indigenous or foreign. Problems, therefore, naturally arise in regard to the availability, procurement and price. Production costs and transport are also important problems. The Government of India had taken cognizance of these problems. The Programmes of Industrial Development under both the First and Second Plans issued by the Planning Commission provide for the re-rolling industry. Apart from this, some statutory enquiries dealt with the industries referred to us, *vide* details below:—

Name of the Agency	*Title of Report*	*Date*
1. Indian Tariff Board .	Report of the Indian Tariff Board on the Iron and Steel Industry.	19th April, 1934.
2. Mr. John Maltby Black .	Report on the Re-rolling Mills Section of the Iron and Steel Industry of India.	April, 1946.
3. The Iron & Steel (Major) Panel.	First and Second Reports on the Iron and Steel Industry.	29th March and 19th September, 1946.
4. The Ferrous Metals Industry Panel.	Report on the Ferrous Metals Industry.	July, 1951.
5. The Tariff Commission .	Report on the conversion charges for Bars and Rods and Fair Retention Price of Electric Furnace Billets produced by Registered Rerollers.	4th December, 1952.
6. The Foundry Industry Panel	Report on the Foundry Industry (as embodied in the Report of the Engineering Capacity Survey Committee).	17th August, 1954.
7. Railway Equipment Committee.	Report on Railway Equipment (Chapter VII deals with Rolling stock, steel castings, forgings, etc.).	15th May, 1956.

CHAPTER I

THE INDUSTRY IN GENERAL

1.1. As already stated, we are dealing with the Steel Re-rolling Industry, Electric Furnaces and Steel Foundries. The Re-rolling Industry is, however, distinct from the Electric Furnaces and Steel Foundries. It is not related to Foundries or Electric Furnaces except to the extent that it may roll down to finished sections ingots or billets cast from liquid steel produced in electric furnaces. (We shall amplify this aspect at a later stage).

1.2. Further, a Steel Re-rolling Mill is essentially different from the Main Producers of iron and steel in that it uses semi-finished steel—normally termed as semis, billets or slabs—or re-rollable scrap instead of beginning from virgin iron ore followed by the various processes of reduction into pig iron and steel of various qualities. The division occurs at the raw material stage. In Re-rolling Mills semis or re-rollable scrap are re-heated to rolling temperature and rolled into a variety of sections mainly of the lighter ranges. It is, therefore, a process of rolling again, steel which had earlier been rolled into some other shape in some other mill. Hence the term 're-rolling'.

1.3. Electric Furnaces produce raw steel, *i.e.*, liquid steel to a required specifications which is then cast into large or small ingots for rolling, depending on size of the mill or end-product, or into steel castings in foundries. The essential raw material is steel melting scrap. Iron ore and pig iron are not used in appreciable proportions. The process is mainly one of re-melting by electrical energy, refining and re-constituting to the required specification by the addition of various fluxes and ferro-alloys. The process lends itself well to the production of high quality steels.

1.4. In Steel Foundries, molten steel is cast into moulds designed to the shape of the finished product. On solidification and cooling these castings are fettled, annealed and machined to the final design. In addition to liquid steel the proper grades of foundry sand is a very essential raw material.

1.5. Before embarking on an intensive study of the problems remitted to us, we realised that (i) the Steel Re-rolling Industry and (ii) Electric Furnaces and Foundries had, broadly speaking, problems of their own which called for separate treatment. We may, however, mention here that the Steel Re-rolling Industry is at present getting some billets from Electric Furnaces operating in the country, and that there is a possibility of getting larger supplies of billets, by setting up suitable types of Electric Furnaces for utilising the Scrap now being treated as unusable. This aspect has been dealt with at the appropriate place in this Report.

1.6. For facility of working, we decided to form two Sub-Committees with the personnel shown below:—

(a) *Sub-Committee on Electric Furnaces and Steel Foundries*:

(1) Shri S. Sambasivan—*Chairman*.

(2) Shri R. M. Agrawal—*Member*.

(3) Shri H. M. Chatterjee, Joint Director, Railway Equipment, Railway Board—*Member*.

(4) Shri D. M. Sen, Deputy General Manager, M/s. Burn & Co., Ltd.—*Member.*

(5) Shri V. Dorasamy, Assistant Iron and Steel Controller (Gr. I)—*Secretary.*

Of the above, Shri Sambasivan and Shri Agrawal were members of the Main Committee, while Shri Chatterjee and Shri Sen were co-opted as representing the Railway Board and the Wagon Builders respectively, who together are the major consumers of steel castings.

(b) *Sub-Committee on Steel Re-rolling Industry*:

(1) Shri B. B. Saksena, Joint Secretary to the Government of India—*Chairman.*

(2) Shri K. S. Raghupathi, I.A.S.—*Member.*

(3) Shri D. P. Dada—*Member.*

(4) Shri L. N. Tikmany, M/s. Bengal Rolling Mills Ltd.—*Member.*

(5) Shri R. L. Bhartia, M/s. Bhartia Electric Steel Co., Ltd.—*Member.*

(6) Shri S. Banerjee—*Member-Secretary.*

Of this Sub-Committee, the Chairman, Shri Raghupathi, Shri Dada and Shri Banerjee were members of the Main Committee, while Shri Tikmany and Shri Bhartia were co-opted to represent further the interests of Steel Re-rollers.

1.7. We held 14 meetings between October 1st, 1956, and April, 1957, at various locations as detailed below:—

3 at New Delhi;
3 at Calcutta;
1 at Bombay;
1 at Jamshedpur;
1 at Patna;
1 at Amritsar;
1 at Gobindgarh;
1 at Negapatam;
1 at Cochin; and
1 at Kanpur.

The meetings at the various places indicated above were fixed with the primary object of studying the problems on the spot and of discussing them with local State Authorities as well as with selected representatives of the industry. At each of these places either individuals or Associations or Chambers were met with the purpose of understanding their view points and discussing their problems. Apart from this, the inspection of typical units as well as allied industrial activities in these areas helped us considerably to widen the background of our approach to the various problems—in particular, regional development.

Details of the meetings and visits are given in Appendix III.

1.8. We submit our report in two Parts, *viz.*,

Part I.—Steel Re-rolling Industry in India.
Part II.—Electric Furnaces and Steel Foundries in India.

PART I

STEEL RE-ROLLING INDUSTRY IN INDIA

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CHAPTER II

STEEL RE-ROLLING INDUSTRY

Historical Review

2.1. To our knowledge, the necessity of producing re-rolled products began with the demand for wire and wire products. The Indian Steel and Wire Products was formed in 1923 under an arrangement with TATAS, under which the latter undertook to produce wire rods—the primary raw materials for all wire and wire products. This arrangement, however, did not materialise. In this first Tariff Board Enquiry into the Steel Industry in 1924/1925, it became apparent that TATAS would not be able to manufacture wire rods. However, a beginning was made with the Steel Re-rolling Industry in India in or about 1928. At that time, the only raw material that could be used was scrap—mainly rails, and it was with the object of salvaging this type of scrap that a Mill was started. It, therefore, began as a salvaging and processing industry. Since then the industry has grown very considerably. In the intervening period, the Indian Steel and Wire Products again approached the Tariff Board in 1930 urging that as TATAS were still unable to supply wire rods, they would still seek protection and that they intended to start a rod mill of their own. This they did. In the meantime, by about 1934, the industry had developed at several wide spread locations such as Calcutta, Banares, Ghaziabad, Kanpur, Lahore and Negapatam. About half a dozen mills were using billets which were rolling from scrap. The industry, however, came under the purview of the Indian Tariff Board Enquiry in 1934, and in its Report the Board expressed the opinion that "as in England and elsewhere, there is a place for these re-rolling mills in a well organised industry, and that the growth of a re-rolling section of the industry capable of dealing with small orders, even of steel products which may compete with the output of the main steel producing works, will be a natural and desirable outcome of the present tendency.... There is scope for the smaller mills in supplying part of the balance of demand, and that they can play their part in overcoming what is certainly the gravest handicap to-day of the Indian industry, the difficulty of distribution". At that time the Board also recommended assistance from M/s. Tata Iron & Steel Co., Ltd., in regard to the supply of billets, commenting that a protected parent industry had under-estimated its responsibility to the smaller industry in the matter of supply of raw material.

2.2. On the recommendations of the Tariff Board (1934) the principle of supplying billets to the Re-rollers, from Tatas and imports was accepted. The import duty on billets was removed and a fair indigenous price was also fixed in relation to imported prices prevailing in those days. The industry continued to develop, and at the beginning of World War II there were about 40 Re-rolling mills in the country. During the early stages of the War, the Re-rolling Industry further developed without control and in favourable conditions of scarcity. It still continued mainly as a salvaging industry utilising all manner of scrap that could be rolled into saleable products. The Government noticed the rapid and haphazard development of this Industry and the consequent shortage of billets and scrap. It, therefore, issued a warning through a Press Note on the 6th

September 1941 [Appendix IV (a)] stating that only those mills which were established before 1st September 1941 could expect assistance in regard to supply of raw materials in the event of Government having to control steel and scrap. During the early years of the war, Government also sponsored the formation of the Steel Re-rolling Mills Association of India with the idea of eliminating unfair competition, ensuring proper distribution of raw materials and of having one organised body to deal with other matters connected with the industry. The Association began functioning with 24 members including some which are now in Western Pakistan. Observing further trends in the development of this industry, the Government of India again issued a Press Note [Appendix IV (b)] in October 1942 advising all existing Re-rolling Mills to become members of this Association. It was made clear there that the Government of India intended to classify, for purposes of allocation of raw materials, the Re-rolling Mills which were already or might become before the 15th November 1942, members of the Association. After the issue of the second Press Note (October 1942), the membership of the Association steadily rose from 24 to 100 and it now stands at 149 (including 2 Main Producers and 4 Secondary Producers).

2.3. As is well-known, control measures in regard to production, distribution and prices for various important commodities were gradually evolved with reference to war-time needs. With reference to Iron and Steel Industry, the Government of India promulgated the Iron and Steel (Control of Production and Distribution) Order, 1941, under the Defence of India Act. The original Order did not have any clause controlling the creation of new units. By 1944, however, a new clause—Clause 11C was introduced into the Iron and Steel (Control of Production and Distribution) Order, 1941, controlling the creation of new productive capacity. This, no doubt, acted as a deterrent to mushroom development. Even after the Defence of India Act was revoked soon after the cessation of hostilities, the Iron and Steel (Control of Production and Distribution) Order was kept alive by virtue of the Essential Supplies (Temporary Powers) Act. It has now been streamlined into one consolidated order for iron, steel and scrap—The Iron and Steel (Control) Order, 1956.

2.4. In the Steel Re-rolling Industry, there were very small units as well as relatively large mills. There was a wide disparity in their efficiency, and classification on that basis from the point of view of raw material allocation as well as conversion cost became necessary. We have to bear in mind that the Iron and Steel Control Order had also come into force then and control over prices had to be developed. It began with War contract rates for Government demands.

Classification of Re-rolling Mills and Pricing

2.5. The Government of India in April 1942 convened a meeting with the representatives of the Re-rollers at New Delhi. It was decided in this meeting to classify the Re-rollers into 4 broad groups, *viz.*, A-1, A, B and C, and the conversion rates from billets to bars were fixed as follows:—

	Bars and Rods
A-1 Re-rollers	Rs. 45/- per ton.
'A' ,,	Rs. 55/- ,, ,,
'B'	Rs. 75/- ,, ,,
'C' ,,	Rs. 85/- ,, ,,

The conversion rates mentioned above were allowed only for orders booked up to 31st October, 1942, and were modified in respect of orders booked from 1st November, 1942 onwards, as follows:—

	Bars and Rods.
A-1 Re-rollers	Rs. 45/- per ton.
'A' „	Rs. 70/- „ „
'B' „	Rs. 90/- „ „
'C' „	Rs. 100/- „ „

The extras for conversion from unsuitable types of raw materials as well as commercial extras charged by the Main Producers for the lighter sections of bars and rods were also applicable. We confine our review of this conversion rate only to the rolling of untested quality materials.

For nearly a year, there was no control on the selling rates of Re-rollers. From the 1st of February 1943, however, the principle of uniform selling prices for Steel was adopted for all producers including the Main Producers. The retention prices of different types of products were different. To adjust them, a Fund known as the Equalisation Fund for Iron and Steel (See Appendix V) was established. The position was reviewed periodically and representations from the Re-rollers were considered in the meetings of the Steel Price Negotiations Committee (S.P.N.C.) of the Iron and Steel Control Organisation. The Ministry of Finance are represented in this Committee. The S.P.N.C., recommended conversion rates from time to time, and on the recommendations of that Body, the Government of India fixed revised rates as and when necessary. We reproduce below the conversion rates for different groups of Re-rollers for different periods. The conversion cost of the C-class Re-rollers relates to rolling from scrap.

Re-rollers' Conversion Cost per ton.

Period	*A-1*	*A*	*B*	*C*
	Rs.	Rs.	Rs.	Rs.
April '42/October '42	45	55	75	85
November '42/October '43	*57/8/-	70	90	100
November '43/March '46	65	85	110	120

*From 1-5-43.

2.6. The process of adjustment of prices for units in the aforesaid groups proved to be rather irksome in actual practice. In March 1946, therefore, the Government of India took up the question of revising the grouping system of re-rollers. It was decided to have with effect from the 1st April 1946, only 3 main categories, *viz.*

(1) A-1 It was the same as the original Group. This class of re-rollers came to be known later on as "Secondary Producers".

(2) Registered Re-rollers and
(3) Un-registered Re-rollers } These embraced the units in the original Groups A, B & C.

The Registered Re-rollers were to roll from billets only; while those in the last category were to depend on re-rollable scrap as raw material. This restriction had to be imposed because of inadequate availability of billets.

(We have not been able to lay our hands on the records explaining the basic principles on which this re-grouping was based.)

The number of Registered Re-rollers at that time was 20 and that of Un-registered Re-rollers was 72.

2.7. The selling prices were fixed in such a way that at the 4 principal ports, *i.e.*, Calcutta, Bombay, Madras and Karachi, the finished material would be available at one and the same price and the other places would receive it at the port price plus "place extras" which represented the Railway freight from the nearest port from among the 4 ports mentioned above. The billet prices were also fixed accordingly.

Under the Iron & Steel Control Order there is no classification as Secondary Producer, Registered Re-roller or Un-registered Re-roller. These terms have been evolved to facilitate working arrangements. Each of these classes has a different price as well as raw material arrangement. They are, however, all "Producers" under the Iron & Steel Control Order. The definition of "Producer" under this Order is "a person carrying on the business of manufacturing iron or steel". All steel re-rolling mills whatever be their class are Producers and are governed by the provisions of this Order. Further such mills as employ 50 or more workers and use power come within the purview of the wider and more comprehensive Industries (Development & Regulation) Act which came into force on 8th May 1952, and in which until the 28th February 1957, Iron and Steel was Schedule Industry No. 4. It now comes under the head "Metallurgical Industries (Ferrous)" under the amended Act.

2.8. The broad groups are—

(a) Secondary Producers.
(b) Registered Re-rollers.
(c) Un-registered Re-rollers.

Details are given in Appendix VI.

(a) *Secondary Producers.*—There are altogether 7 Secondary Producers. These include:

1. M/s. Tinplate Co. of India Ltd., Golmuri (Bihar).
2. M/s. Indian Tube Co. (1953) Ltd., Jamshedpur.
3. M/s. Kalinga Tubes Ltd., Choudwar (Orissa).

The Tinplate Co. of India Ltd., use tinbars as raw material. The other two Companies use Skelp or Strip as raw material. In as much as these Companies do not use steel billets for their operations, they do not come within our purview.

Perhaps with the exception of one, the Secondary Producers began with or at a later stage entered into, contractual agreements with the Main Producers—Tatas, in regard to the supply of billets. For practical purpose, they may be regarded as associates of the Main Producers producing products such as bars and rods, wire rods, wires and wire-products, baling hoops, spring steel, Railway sections and light structurals. Since 1st April 1946, their conversion rates were lower than those of the other classes. In other words, they received billets at higher prices but sold finished materials at the statutory Column I rates (See Appendix VII). These Secondary Producers have been receiving a regular supply of billets on a better scale than others.

(b) *Registered Re-rollers.*—These mills 21 in number also work on billets and are mainly producers of bars and rods. Of late, some of them have increased their production of rods (below 1/2" dia.) and some special sections. For sometime, after the 1st April 1946, they were receiving billets at about Rs. 25 per ton less than the Secondary Producers referred to above (Rs. 181—156). This made up for the greater conversion rate which had been agreed to. From the 27th January 1948, however, their conversion rates were brought to parity with those of the Secondary Producers.

This parity continued upto 31st December 1952. Repeated representations were received from the Registered Re-rollers that the existing conversion rates were inadequate in view of the rise in several elements in the build-up of this cost. The Government of India, therefore, decided to refer this entire question to the Tariff Commission in 1952. The cost of the Secondary Producers were not required to be examined by the Tariff Commission. The Commission submitted their *Report in December* 1952, and the Government of India accepted their recommendation regarding a fair conversion rate of Rs. 130 per ton for steel sections rolled from billets based on the then prevailing billet price of Rs. 286 per ton. In order to bring the retention price (statutory price of billets plus agreed conversion cost *i.e.*, the price which they can retain) to parity with the Column I sale price, Government decided that it would be more expedient to supply them billets at a rate proportionately lower than the statutory rate. The Registered Re-rollers, therefore, started receiving billets at Rs. 20/8/- per ton less than the statutory rate and the necessary adjustment for this was made in the surcharge adjustment with the Equalisation Fund for the Main Producers who supplied the billets. Similar adjustments were also necessary for subsidised imported billets.

This difference in the statutory price of billets and the price at which billets were supplied to the Registered Re-rollers has come to be known as "subsidy", reference to which appears in our terms of reference. At the time when the Tariff Commission recommended the increased conversion cost for the Registered Re-rollers, the Registered Re-rollers were getting billets more or less for one shift working. For the last two years or so, the supply position of billets has improved because of large imports in addition to the supplies available from the Main Producers in the country and it has made it possible for the Registered Re-rollers to work on a better scale and orders for finished materials are planned on them by the Iron & Steel Controller. Presumably, on this consideration, the Government have withdrawn the "subsidy" from 1st January 1957. This, however, is only a provisional arrangement. Government have referred the question of revising the conversion rate or the "subsidy" to the Tariff Commission, and a decision will no doubt be taken in due course.

(c) *Un-registered Re-rollers.*—There are 122* Un-registered Re-rollers in the country. These mills have been working on re-rollable scrap allocated through the Steel Re-rolling Mills Association of India and such scrap from local and imported sources as they can procure themselves. The Government of India have allowed them to get raw materials from uncontrolled sources to utilise their idle capacity due to poor allocations of raw materials from controlled sources.

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*This includes about 50 Un-registered Re-rollers who used to operate in the Indian States before their integration with the Indian Union in 1948. There were a large number of mills operating in Patiala, Nabha, etc., which, after the merger of the States, came under the purview of the Iron and Steel Control of the Indian Union. It may also be noted that in pursuance of the Government of India policy of rehabilitating industries left behind in Pakistan after the Partition, several units were allowed to establish themselves in the Indian Union. Their status remains the same but new locations were decided in consultation with the State Government.

Their production is not controlled by the Government of India; but such materials as are produced from controlled scrap are placed at the disposal of the State Steel Licensing Authorities who operate on them by issuing permits. They function as registered stockists also and are entitled to sell their materials at Col. III rates which are on an average Rs. 45 per ton more than the Col. I rates applicable to the Secondary Producers, the Registered Re-rollers and the Main Producers.

These mills are capable of producing bars and rods and a variety of special sections.

CHAPTER III

RAW MATERIAL REQUIREMENTS OF THE EXISTING RE-ROLLING MILLS IN INDIA; POSSIBILITIES OF EXPANSION OF THE INDUSTRY AND THE AVAILABILITY OF RAW MATERIALS [SEE TERMS OF REFERENCE (a), (c) AND (d)].

3.1. The raw material requirements of the Re-rolling Mills are linked with their capacity. *Capacity* is a "complex technical concept". The *rated capacity* of any type of plant is something which is a sort of target to attain which engineers have to design the different supporting equipment. A Steel Re-rolling Mill can be designed to a particular rated capacity. To attain a particular target of production the various factors in the build-up of such a unit should be properly balanced. By and large the Steel Re-rolling Mill Industry has not developed in this manner. A large number of mills developed during the War to meet the sudden spurt in demand. In such cases there can be no "rated capacity" of a unit. The capacity has to be assessed. Several factors have to be taken into account. The lay-out is important. With a poor lay-out, even with the best of facilities, there may be serious hinderances to the smooth flow of operations. Besides the lay-out, the following factors are important:

(a) *The Re-heating Furnace.*—The design of the furnace, the type of fuel used and the method of handling the materials determine the capacity of the furnace.

(b) *The mill proper.*—The important features in this are its size (*i.e.*, roll diameter), the number stands and the relative roll speeds, the power of the mill drive, the method of transmission of this power into the mill, and types of bearing and lubrication used.

(c) *Handling facilities* for raw and finished materials, *e.g.*, storage, processing by mechanical or manual shearing and transport to the re-heating furnace, finishing, facilities such as cooling beds, removal of rolled out finished materials and proper stacking and eventual transport facilities to the delivery point.

3.2. *Assessment of capacity.*—The capacity of the Re-rolling Industry was first assessed in 1941 when the Steel Re-rolling Mills' Association was formed. The assessment was made by Shri A. Samad, then Assistant Chief Metallurgist to the Government of India. He estimated that the capacity of 38 mills situated in the country excluding the mills now known as Secondary Producers was 60,000 tons per annum on single shift basis.

A re-assessment was made in 1946 by the Government of India in the late Department of Industry and Supply with the assistance of the Steel Re-rolling Mills Association. The capacity was then fixed at 175,614 tons per annum on one shift basis. There were 20 Registered Mills and 72 Un-registered Mills in operation.

Since the last assessment had been made, it had come to the notice of the Iron & Steel Controller that several mills had improved their plants and machinery and some had added equipment steadily from time to time. The result was that in 1955 claims were made by a number of re-rolling mills that their capacity was much more than assessed in 1946.

With a view to ascertaining the factual position, the Iron and Steel Controller had issued a questionnaire on technical data in 1955.

The scrutiny of the replies received showed that in some cases the figures shown were rather exaggerated. It also came to our notice that since the submission of the returns called for by the Iron & Steel Controller, certain re-rolling mills had put up additional capacity--some without proper sanctions. It was, therefore, agreed that the factual position should be studied afresh.

As already pointed out, there are a large number of factors which have to be taken into account in determining the capacity of a re-rolling mill. We, therefore, approved a revised Questionnaire (Appendix VIII) and the Iron & Steel Controller undertook to collect from the Re-rollers the latest factual position. A few mills have not responded to the Iron & Steel Controller's Circular, and in their cases the capacity has been taken at the same figure as in 1946. The Iron & Steel Controller has also brought to our notice that certain returns called for a further check, which was arranged through M/s. M. N. Dastur and Co. (Private) Ltd., Calcutta (who are also assisting Tatas in development plans). This technical check-up by a private company had the concurrence of the Steel Re-rolling Mills' Association, who agreed to bear the expenses. We had no objection to the employment of the services of M/s. Dastur for the purpose on the understanding that if they were acting as consultants or otherwise already in contact with any of the Re-rolling mills, whose returns called for further scrutiny, the re-check would not be carried out by that Organisation (M/s. Dastur) but would be undertaken by the technical staff at the disposal of the Iron & Steel Controller. This re-check is still in progress. As we cannot wait any longer for the completion of this work undertaken by the Iron & Steel Controller and M/s. Dastur & Co., we have to rely on the best estimates of the existing capacity that can be made by the Iron & Steel Controller. His estimate of the existing capacity (as on 1st November 1956) of the Re-rolling Mills of the various categories, including Secondary Producers, is about 700,000 tons per annum, on one shift basis. This estimate in the circumstances explained above, must be regarded as 'provisional'. The State-wise break-up of this 'provisional' estimate of capacity is given below:

Annual Single Shift Capacity of existing Secondary Producers, Registered and Un-registered Re-rollers on a State-wise basis.

Figures within brackets indicate number of Units.

States	Secondary Producers	Registered Re-rollers	Un-registered Re-rollers	Total Capacity
	Tons	Tons	Tons	Tons
1. Andhra	..	..	..	..
2. Assam	..	..	..	..
3. Bihar	44,100 (2)	..	540 (1)	44,640
4. Bombay	..	54,000 (3)	43,740 (15)	97,740
5. Delhi	..	3,600 (1)	15,360 (5)	18,960
6. Himachal Pradesh	..	..	..	..
7. Kashmir	..	..	..	..

States	Secondary Producers	Registered Re-rollers	Un-registered Rollers	Total Capacity
	Tons	Tons	Tons	Tons
8. Madras	16,000 (1)	2,400 (1)	5,520 (1)	23,920
9. Madhya Pradesh . . .	..	..	14,280 (5)	14,280
10. Mysore	..	..	..	..
11. Manipur	..	..	..	..
12. N. E. F. A. . . .	..	..	..	..
13. Kerala	..	..	..	..
14. Orissa	..	..	3,600 (1)	3,600
15. Punjab	..	14,760 (3)	127,040 (52)	141,800
16. Pondicherry . . .	..	..	..	..
17. Rajasthan	..	8,400 (1)	4,800 (4)	13,200
18. Tripura	..	..	..	..
19. Uttar Pradesh . . .	..	42,000 (5)	46,720 (18)	88,720
20. West Bengal	22,150 (1)	122,880 (7)	105,060 (20)	250,090
TOTAL	82,250	248,040	366,660	696,950 or say 700,000

NOTE.—(1) The following Secondary Producers have been excluded in the above statement as they do not roll from billets.

(1) Tinplate Co. of India Ltd.

(2) India Tube Co. (1953) Ltd.

(3) Kalinga Tubes Ltd.

(2) The computation has been based on rolling from billets.

(3) It is understood that in States such as Bihar, Punjab, West Bengal and U.P., a few re-rolling mills have been put up without proper sanctions. Some units are said to be defunct. Full details are not yet available with the Iron & Steel Controller. The capacity of such units is not reflected within the above statement.

(4) Units which have already been permitted to shift have been included in the States to which they are shifting.

Some capacity came up otherwise—there are a few instances where the erstwhile Indian State Governments, not knowing the extent of their powers in this regard, had permitted the installation of such capacity, and in some cases, the plant and machinery which was mainly for purposes of replacement was put up along with the plant already in position. On a strict view the capacity created without complying with the Law should not be recognised by Government. We feel, however, that it would not be in the national interest to ignore the existence of such plant and machinery and have, therefore, included it in our computation of the existing capacity.

In addition, some plant and machinery has been licensed by the Iron & Steel Controller to be obtained from abroad or indigenously, mainly for replacement purposes but with a warning that if the installation of it resulted in stepping up the capacity of units, this fact would not entitle the Re-rollers concerned to claim any higher capacity than that recognised previously. We have reason to believe that most of the plant and machinery now being arranged will have the effect of increasing the capacity of the Re-rolling units. We suggest that the capacity of the plant and machinery now on order, may, for the consideration urged above with reference to similar plant and machinery already in existence be taken as projected additional capacity. This additional capacity will be determined by deducting from the aggregate capacity of the plants on order, the capacity of the plant proposed to be replenished.

The Iron & Steel Controller has made a rough calculation of the additional capacity covered by his sanctions but yet to be established. In all, it is about 104,760 tons per annum. The State-wise break up of this, on the basis of existing locations of the parties concerned, will be as follows:

Additional 1 Shift Capacity based on Plant and Machinery being acquired by import or otherwise under sanctions already given.

States	Secondary Producers	Registered Re-rollers	Un-registered Re-rollers	Total
	Tons.	Tons.	Tons.	Tons.
1. Andhra	..	2,000	..	2,000
2. Delhi	..	..	4,800	4,800
3. Madras	3,600	2,000	6,480	12,080
4. Punjab	..	..	17,760	17,760
5. Uttar Pradesh	..	10,800	..	10,800
6. West Bengal	14,000	13,800	29,520	57,320
TOTAL .	17,600	28,600	58,560	104,760

3.3. **Break-up of capacity with reference to types of raw materials used.**—The Re-rolling industry is not wholly based on the use of the same kind of raw material. While the major part of the existing capacity is based on the use of billets, quite a few—particularly smaller units—depend on re-rollable scrap for their operations. We feel that re-rollable scrap is not the proper material for the manufacture of quality products, but its use will be continued in mills below 8″ size—these can operate economically on re-rollable scrap. The capacity of such units which can suitably run on re-rollable scrap is 26,200 tons per annum on single shift.

The remaining capacity* which should be taken as based on billets, comes to 662,738 tons per annum on single shift. The State-wise break-up of the capacity which should operate on billets alone is indicated below:

Sl. No.	Name of State	Secondary Producers	Registered Re-rollers	Un-registered Re-rollers	Annual Total Capacity
		Tons.	Tons.	Tons.	Tons.
1.	Bihar	44,100	..	540	44,640
2.	Bombay	..	54,000	43,740	97,740
3.	Delhi	..	3,600	15,360	18,960
4.	Madras	16,000	2,400	5,520	23,920
5.	Madhya Pradesh . . .	..	..	12,360	12,360
6.	Orissa	..	..	3,600	3,600
7.	Punjab	..	14,760	107,876	122,636
8.	Rajasthan	..	8,400	2,136	10,536
9.	Uttar Pradesh . . .	..	42,000	41,656	83,656
10.	West Bengal . . .	22,150	122,880	99,660	244,690
	TOTAL .	82,250	248,040	332,448	662,738

3.4. **Raw materials.**—No difficulty is anticipated in the mills below 8" in size getting their future requirements of re-rollable scrap as hitherto. As regards the units based on billets, the annual total capacity on single shift basis comes to 662,738 tons. Although a number of such units have had to restrict their operations to single shift or even less, it is the generally accepted practice for such units to work double shift to ensure economic production. Their total capacity on double shift basis works out to 1,325,476 tons per annum. Allowing for wastage at 10 per cent., their total requirements of billets on double shift works out to 1,458,024 tons per year.

3.5. **Availability of raw materials.**—During the last five years, billets were allocated from indigenous sources to the various categories of Re-rollers as shown in the table below:

Years	Secondary Producers	Registered Re-rollers	Total
	Tons.	Tons.	Tons.
1952	125,824	47,310	173,134
1953	113,555	100,763	214,318
1954	122,890	116,018	238,908
1955	135,949	121,934	257,883
1956	144,748	47,187	191,935

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*This would include Re-rolling mills of 8" in size. Such units can be given the option of operating on billets or scrap but not on both. For our computation purposes, we have treated them as units dependent on billets. If any such units opt to work on scrap, it would not materially affect our estimates.

These allocations were made to Secondary Producers generally on the basis of double shift, while to the Registered Re-rollers, the allocated supplies were just sufficient for a little more than one shift except last year when the re-rolling industry could operate on a better scale. Un-registered Re-rollers operated mainly on scrap till about the end of 1956. In December last, we suggested to the Iron & Steel Controller that this class of Re-rollers should, in equity, be given some supplies of billets. He consulted the Steel Re-rolling Mills' Association of India and from January 1957 allocations of billets to the Un-registered Re-rollers have been started. The Un-registered Re-rollers are allocated about 30 per cent. of the total available quantity after providing for the requirements of the Secondary Producers.

In addition, imports of billets were arranged to supplement local supplies. Details of allocations from imports are given below:

Year	Secondary Producers	Registered Re-rollers	Total
	Tons.	Tons.	Tons.
1952	..	15,400	15,400
1953	..	7,000	7,000
1954	5,500	9,500	15,000
1955	9,600	59,100	68,700
1956	26,599	116,339	142,938

3.6. The following table shows the position regarding actual production of the various categories of re-rollers:

Year.	Secondary† Producers.	Registered Re-rollers	Un-Registered* Re-rollers
	Tons.	Tons.	Tons.
1952	117,263	74,330	25,823
1953	104,735	93,661	29,664
1954	124,970	119,936	37,068
1955	126,322	127,013	53,336
1956	130,711	193,085	73,093

†The Tinplate Company's production is not included in this. Figures include the production of processed materials such as wire and wire products and bolts, nuts, rivets etc., produced by M/s. Guest, Keen, Williams, Ltd., and Indian Steel and Wire Products.

*These operated mainly on scrap till the beginning of this year (1957) and should not therefore be taken into account in the computation and output from billets.

3.7. It will be seen from the above that, in spite of a liberal import policy, the Re-rolling Industry could not get its requirements up to the desired level. The position will deteriorate in future, if owing to the prevailing foreign exchange stringency, a restrictive import policy is adopted. How long such a situation will continue is difficult for us to say. However, a relieving feature is that with the coming into existence of the new steel projects the local supply of billets is expected to improve. According to the Second 5-Year Plan the local availability will be as under by the end of the Plan period:

Tatas IISCO Bhilai Durgapur	630,000 (excluding 100,000 tons of tin bars for the Tin-plate Co. of India, Ltd.)

Besides, certain supplies of Semis (ingots and billets) are expected to be available from other sources by the end of 1960-61.

Anticipated availability of Semis for rolling by 1960-61

	Tons per annum.
1. Existing Electric Furnaces	40,000 Ingots.
2. Ordnance Factories	10,000 Billets.
3. Additional availability from conversion of unusable scrap	150,000 Ingots.
4. *From new furnaces already sanctioned and likely to be set up	60,000 Ingots.

Nothing can be said about the quantum that would be available in the near future. Anyway, it is clear that it would not be possible to cater to the entire industry as it exists to-day on 2 shift basis. For some time longer, therefore, it will be necessary to regulate billet supplies in a manner which will more or less maintain the present pattern of distribution.

3.8. It is common knowledge that in spite of the Government of India's liberal import policy in regard to billets, it was found necessary to obtain from abroad substantial supplies of certain sections for which capacity existed in the country. Separate figures of imports of such items are not published in the Sea-borne Trade Accounts, but our estimate of such imports during the last 3 years is as follows:—

Year	*Tonnage of bars rods flats and rounds imported*
1954	4,273 tons.
1955	33,802 „
1956	341,273 „

This leads one to conclude that it is difficult to get billets from foreign countries. The foreign suppliers are naturally interested in supplying finished items rather than Semis, as far as they can manage. We suggest that in future, the Government of India should make special efforts to get from foreign steel producing countries, through trade agreements or otherwise, as much billet supply as possible to supplement the indigenous supplies, to enable the re-rollers to work their units on an economic basis. At least, it should be ensured that the industry as a whole does not get less than what it was given in 1956.

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*By 1960-61 the existing and projected Electric Furnaces will have a capacity of 250,000 tons of liquid steel per annum. The demand for castings will be 72,000 tons by that time for which 144,000 tons of liquid steel will be utilised and 106,000 tons of steel will be available for making ingots. It would produce approximately 100,000 tons of ingots. As the existing Electric Furnaces are already producing 40,000 tons of ingots, the additional availability of ingots will be 60,000 tons per annum.

Imports of semis on as large a scale as possible are important for more than one consideration. Firstly, in view of the growing demand for the products of the Steel Re-rolling Industry, re-rolling capacity already existing in the country should be utilised to as large an extent as possible. Secondly, the import of raw materials would mean less drain on our foreign exchange resources than if the finished products were to be obtained from abroad. Such an arrangement would be commendable from long range considerations also, as, if at a later date (in the Third Plan Period or thereafter), larger supplies of billets become available, they can be readily utilised, adequate re-rolling capacity having already been established.

3.9. It would take some time to increase the billet production by utilising the scrap available in the country. Meanwhile, it would be in the national interest if the mills of 8" and above are also advised to make use of as much scrap as possible to secure the maximum output. The Railways and the Main Producers, namely, Tatas and the Indian Iron & Steel Co., are the most important sources of re-rollable scrap. We understand that the Main Producers have plans to utilise their entire scrap in the future. It is suggested that till such time as the raw material position for the Re-rolling Industry continues to be tight, the Main Producers may be asked to make available to the Re-rolling Units, scrap at least to the same extent as during the years 1955 and 1956.

3.10. Having regard to the trend of demand for re-rolled sections, we reckon that the demand by 1960-61 will far exceed the estimates given in the Second Five-Year Plan, with reference to the supply position of billets. The growing demand can, to a great extent, be taken care of by utilising the existing mills and enabling them to work double shift. This suggests the advisability of making better provision for billets in the Third Plan Period. The possibility of establishing a separate billet-making plant may be considered with reference to that Plan.

3.11. If adequate supplies of billets cannot be arranged, the available supplies will have to be rationed among the re-rollers *pro-rata* on the capacity as recently assessed at our instance by the Iron & Steel Controller. In such allocations of billets (i) and units which were given the option recently to change over to billets but preferred to continue to operate on scrap and (ii) the un-authorised capacity (see Appendix IX), will have to be ignored. We may point out that unless supplies for one shift at least are assured to the industry, there would be a danger of larger units having to suspend their operations. This should not, however, be construed to imply in any manner that we suggest a change in the present pattern of raw material distribution to the Secondary Producers.

3.12. For all billets allocated, production orders should be planned by the Iron & Steel Controller in the same way, as on the Main and Secondary Producers.

3.13. **Assessment of additional capacity to be set up in the light of developments which are taking place in other sectors of the economy.**—The overall demand of any particular country for an item can be assessed with some degree of approximation with reference to the following factors:

(a) area and population;

(b) degree and tempo of industrial activity; and

(c) the plans of development in all sectors of economy.

For India, the Planning Commission have estimated a total demand of 4,500,000 tons of finished steel developing by 1960-61. Region-wise demands have not been given, but the break-up of broad categories according to the class of producers has been given, taking into consideration the entire expansion of the Industry including the three new integrated steel plants in the Public Sector. It is considered that the production of the Main Producers and the Secondary Producers will continue to be distributed on the same pattern as now. In other words, their products would move as at present over a wider radius and would mainly be used for meeting Central Government's demands which are spread over the whole country. Of course, in actual practice, orders would be planned on different units having regard to the most convenient source of supply.

3.14. In the context of our terms of reference, we have to work out the quantity that the so called "pure" re-rollers will be expected to produce by 1960-61. For this purpose, we have taken only such categories as come normally within the province of such Re-rollers. These categories broadly are—

(1) Medium and light structurals.

(2) (a) Rounds and flats ½" and above.

  (b) Rounds and flats ½" and below.

(3) Hoops and box strapping.

According to the Planning Commission, the total demand for the above categories of steel by the end of the Second 5-Year Plan would be 1,710,000 tons per annum. In fact, the share of Re-rollers in the programme for steel production of 4.5 million tons was kept at this figure after assessing the likely demand for re-rolled sections by that period. Of this, 1,371,000 tons are expected to be produced by the Main Producers and Secondary Producers. The balance of 339,000 tons per annum would come from "pure" re-rollers. Development is, however, progressing at a rapid pace in various spheres such as building activity, the formation of Industrial Estates, Railways, Transport, Steel Processing Industry, the spreading of industries into the rural areas, the major Hydro-Electric Projects and others, which not only require steel for their own construction but also will be developing townships and industrial activity around them. The demand for re-rolled products will, therefore, progressively increase. Having regard to the general trend of demand, we are of opinion that the Planning Commission's target for re-rolled sections is rather conservative. It is, however, difficult to estimate the ultimate demand with any degree of precision. We should content ourselves by suggesting that every endeavour should be made to augment the local supplies of billets for re-rolling purposes.

3.15. As indicated in Chapter III (para. 3.7), a further 260,000 tons of raw materials may be expected annually from the Ordnance Factories, electric furnaces—existing and sanctioned—and as the result of the conversion of unusable scrap. The broad break-up is 10,000 tons of billets from the Ordnance Factories and 250,000 tons of ingots. The billet equivalent of these 250,000 tons of ingots would be about 236,250 tons. This means that from these sources the total availability of raw materials in terms of billets would be about 246,250 tons yielding about 221,000 tons of finished steel—all to be available from Re-rollers. The annual total production of pure re-rollers by 1960-61 may, therefore, be taken to be 560,000 tons (*i.e.*, 339,000+221,000).

Elsewhere, we have suggested that the Mysore Iron & Steel Works might increase their production of billets and make 15,000 tons available annually to the Re-rolling Industry in South India. As however, this supply is uncertain, we have not included it in our computation of availability.

For all practical purposes, it may be assumed that the all-India demand for re-rolled sections would correspond to what can be produced in the country.

3.16. The question that calls for consideration is how the demand for individual States should be estimated. We have tackled this problem from various angles, *e.g.*, geographical position, area and population and the present and expected state of general and industrial development. The conclusion we have come to is that a realistic approach would be to proceed on the basis of existing (the 5-Year Plan has gained some momentum) steel allocations to the States, which have significant proportions of products made by re-rollers. Such allocations mainly pertain to the following heads:—

(a) State Government Development Schemes (G.D.S.)
(b) State Steel Processing Industries (S.P.I.)
(c) State Non-agricultural.

To these heads we have also added the State-wise break-up of the Agriculture quota, the Central G.D.S. quota and the Relief Rehabilitation and Housing Schemes (R.R.H.S.) quota. We have also considered it useful to take into consideration the allotments under the Cottage & Small Scale Industries quota—but unfortunately the State-wise break-up is not yet available for the year 1957-58. However, we have felt that it would not be unreasonable to take the 1956-57 annual quota figures, as the basis of the overall allocation for this year (1957-58) is nearly the same as last years. The latest quarterly allocations have been multiplied by four in order to determine the annual allotment, as this would give a more uniform basis for the yearly figure. The aggregate amounts have been determined for each State on this basis. The total amount of such sections available for "pure" re-rollers has been distributed among the various States on the basis of existing steel allocations. For practical purposes, these distribution arrangements may be regarded as depicting the demand position with reference to "pure" re-rollers in the several States. Details are shown in Column 4 of Appendix XI.

3.17. As stated earlier, the Steel Re-rolling Industry is amenable to regional development. Re-rolling units which can work economically on scrap can get their requirements easily, as it is, generally available throughout the country. Those which have to depend on billets for their operations, can get at least a portion of their requirements if, as recommended in Part II of this Report, suitable electric furnaces are installed to convert scrap into billets. The re-rolling units would then have to tap the other sources of supply to supplement the supply of billets available from the neighbouring sources. The Government of India's recent policy decision to make steel available at all important places in the country at the same price would help such industrial growth. Such a development would avoid cross-movements of raw materials and reduce the pressure on the Railways. Even for the distribution of finished products, rail transport facilities would be needed to a lesser extent than now.

3.18. Appendix XI shows, besides demand on "pure" re-rollers in different States, the existing re-rolling capacity therein on double shift and the extent to which a particular State is surplus or deficient. That Appendix also gives an idea of the final position as it would emerge if the additional plant and machinery already sanctioned is installed in the States concerned.

It will be seen that in the following States there is need for creating new capacity to the extent indicated against each:—

State .	Tons Per annum (On two shifts)
1. Andhra	27,752
2. Assam (including Manipur, Tripura & N.E.F.A.) .	13,048
3. Bihar	27,816
4. Himachal Pradesh	952
5. Jammu and Kashmir	4,144
6. Madras (including Pondicherry)	10,376
7. Madhya Pradesh	25,032
8. Mysore	19,824
9. Kerala	12,824
10. Orissa	11,000

(The other areas have surplus capacity).

3.19. The question as to how the gap should be filled has been dealt with in Chapter V. Here we had better deal with the question as to what should be regarded to constitute a minimum economic unit.

3.20. The question of determining a minimum economic unit is very difficult to solve, particularly when applied to existing units. The investment in capital ranges from Rs. 50,000 to Rs. 50,00,000. No two units are comparable as regards their equipment, working space and facilities, technical resources etc. Hence for the existing mills two shift operation should be considered as economic and no minimum limit to production per shift need be prescribed.

3.21. With reference to new units, it would be advisable to set up a fair standard of production by a moderate sized mill capable of producing the common sections of bars and rods as well as an assortment of a few special Sections. In this we have also kept in view that such a unit should be able to operate without a subsidy to offset higher production cost. Based on a 10″ mill with 300/400 H.P., drive and a finishing delivery speed of 600/700 feet per minute, monthly production of approximately 400 tons could be expected on ¼″ dia. round. As this item normally carries a fair 'extra' a minimum production of 400 tons could be considered economic. The capacity would naturally be higher for the heavier sections, such as 1/2″, 5/8″ dia. rounds. Furthermore, a mill of this type could also lend itself well to the rolling of lighter profiles coming under the so-called special sections.

For the heavier special sections, we are of the opinion that those having 18/14″ Roughing Mills could well adapt themselves to their production. What we have stated above would, therefore, indicate that the minimum economic capacity of a mill operating on billets would be 400 tons per month for a 10″ mill.

3.22. As regards mills which would work on re-rollable scrap our study of some typical units points to the conclusion that an 8″ mill could take care of the common types of re-rollable scrap expected to be available in the country. Such a mill with adequate drive should be capable of producing about 6 tons of ¼″ dia rounds per shift or approximately 15 tons of finished products from scrap per month operating a single shift or 300 tons of finished products operating on billets. It would be desirable to avoid operating on 8″ mill both on billets and scrap at the same time. In our opinion, no rolling units below 8″ in size need be allowed to be set up in future.

CHAPTER IV

WAYS AND MEANS OF IMPROVING THE EFFICIENCY OF RE-ROLLING UNITS AND STEPS TO BE TAKEN TO MAKE THEM ECONOMICAL AND INDEPENDENT OF ANY FORM OF SUBSIDY IN REGARD TO PRICES OF RAW MATERIALS. [Terms of reference (b)].

4.1. It is difficult to define 'efficiency' in precise terms, as it involves consideration of several factors. In our visits, to several mills in different parts of the country, we tried to get a general idea of the efficiency attained. In Gobindgarh (Punjab), where there are a number of very small mills, we noticed that these (proprietory concerns with low overheads) are capable of using a variety of raw materials placed at their disposal and could produce a wide range of sections including special sections in satisfactory quality. They are doing commendable work. They are, however, dependent mainly on scrap, and there is, therefore, need to introduce sustained quality control.

4.2. We have also, in the course of our visits, seen the major Re-rollers who have better equipment and have more balanced plants with heavier overheads, both from the point of view of plant and machinery as well as supervisory staff. Some of them are endeavouring to introduce progressively quality control. Overheads are no doubt relatively high and considering the value of plant and machinery, depreciation is also relatively high compared to the smaller mills.

4.3. In the long run, however, when the gap between demand and production is gradually bridged, balanced and modernised plants with effective quality control should be preferred. We have also been given to understand in all our visits that if adequate quantities of billets were supplied instead of scrap to the Un-registered Re-rollers, they would do as well as any other Re-roller, however small their mills. These mills can improve their output and the quality of their products if they are assured of supplies of billets and have not to resort to the use of scrap only. We are, however, conscious of the circumstances in which mills below 8″ in size have come into existence and would suggest that while they may continue to base their operations on scrap as at present, they should be ultimately replaced by modern mills operating on billets.

4.4 It has come to our notice that orders for small quantities of Sections are planned on high production mills. This disturbs their normal operations and results in a disproportionate reduction in their output. On the other hand, smaller units have demonstrated by actual performance that, given the proper type of raw material, they can turn out, much more quickly and in satisfactory quality, Sections (including Special Sections, *see* Appendix X) required in small quantities. We, therefore, recommend that the future planning of orders should aim at utilising the capacity of the larger mills for meeting the demands for Common Sections which are suitable for mass production and that of the smaller mills for the production of other Sections as far as possible.

As large capacity for producing bars and rods, certain sections such as 1/2″ and 5/8″ dia. rounds and squares, flats and light structurals is available with the Re-rolling Industry, it would be advisable to restrict their production at the major steel plants in the country and to utilise their capacity for the production of bigger sections for which the demand is not fully met.

4.5. We have noticed that in a number of mills equipment is obsolescent and ill-balanced. With make-shift arrangements and their own dexterity and perseverance they have been able not only to sustain themselves but also to produce reasonably good products. Ultimately, improved efficiency should be aimed at. It can be secured, among other things, by

(a) Improved lay-out obtained by revamping;

(b) Modernisation and balancing of equipment, for example, furnace capacity to the mill proper and the cutting and handling facilities;

(c) Providing up-to-date technical know-how and supervision; and

(d) Ensuring regular and adequate supplies of raw materials of uniform quality.

4.6. At present lack of the latest technique stands in the way of many mills operating to the maximum advantage. For modernisation or revamping also the need for such technical know-how is great. Small mills and even many of the bigger mills are not in a position to obtain such know-how from within the country. It is gratifying that in response to the request of the Steel Re-rolling Mills Association of India the Government of India have arranged for technical assistance under a Foreign-aid Programme. A foreign expert is expected in India shortly to advise the rolling mills on their technical problems.

The advisability of including rolling mill engineering as a subject in the technical colleges and institutions may also be considered. Such arrangement would develop indigenous talent for the future.

4.7. There are a considerable number of Re-rollers who at present cannot work economically because of the paucity of raw materials. At the same time, we have observed that there is a congestion of small Re-rolling units in certain areas. This is primarily due to the availability of the requisite type of skill locally. We suggest that it would be of greater advantage if 2 or more of them could be induced to pool their resources and work as a single unit. They would get the advantage of larger supply of raw materials and by suitable mutual arrangement share in the overheads and supervision. We anticipate that there might be some resistance to such an arrangement: some proprietory concerns may prefer to continue as they are. Gradual transition to mergers, however, would be advantageous and could be considered in the long run.

4.8. We have seen some re-rolling mills where the working conditions are not quite satisfactory. They are situated in narrow bye-lanes in congested quarters close to places used for dumping garbage and rubbish of the area. The lighting arrangements are rather poor. In our opinion, it would be conducive to improved efficiency if the owners of the mills are persuaded to shift their mills to better sites preferably to the Industrial Estates wherever they are being developed.

4.9. **Question of Subsidy.**—In Chapter II, we have explained how the system of grant of a 'subsidy' in the matter of supply of billets to 'Registered Re-rollers' was first introduced and has continued. As early as 1952, the entire question was gone into by the Tariff Commission. At that time, the Registered Re-rollers were getting billets for not more than one shift working. As stated earlier, for the last 2 years or so, the supply position of billets has improved because of larger imports of raw materials in addition to the supplies available from the Main Producers in the country. This made it possible for the Registered Re-rollers to work on a better scale. The question, therefore, as to whether there was any longer justification for the continuance of the 'subsidy', Government have referred it to the Tariff Commission. Meanwhile, with effect from 1st January, 1957, the 'subsidy' has been withdrawn as a provisional measure.

No doubt, Government will announce their decision after they have received the Tariff Commission's recommendations and considered them. In the circumstances, we would content ourselves by making a few observations on the subject. The question of 'subsidy' is, as is well-known, connected with the billet supply. In our reckoning, the larger mechanised Re-rolling units, if given adequate supplies of billets, can pay their way without any 'subsidy', notwithstanding their comparatively large capital outlay and high overheads. All such units may be treated as Secondary Producers. We have also reason to believe, that there would be no need to give any 'subsidy' to the smaller units provided they get regular supply of billets to work double shift. There may be other conditions under which a 'subsidy' may not be justified.

CHAPTER V

PRINCIPLES TO BE FOLLOWED IN ESTABLISHING ADDITIONAL RE-ROLLING CAPACITY IN THE DEFICIENT AREAS [Term of reference (e)].

5.1. As indicated earlier, the Re-rolling Industry lends itself to regional development. The existing capacity on single shift basis and the requirements expected to be met by 'pure' re-rollers, in the various States are indicated in Appendix XI. To assess whether a particular State has surplus capacity or needs additional capacity, the existing rolling mill capacity should be worked out on 2 shift basis. The deficiency, if any, should be made up by resorting to the following steps in the order mentioned—

(1) The parties which have been allowed to import or otherwise obtain new rolling mill plants may be advised to establish their plants in a State other than the State where there is already over concentration of capacity.

(2) Mills in the surplus (congested) areas may be permitted to transfer their existing plant and machinery to the deficient States.

(3) The existing Mills in the State may be permitted to expand their plant suitably.

(4) If the gap cannot be filled up in any one or more of the above ways, permission to obtain new plant and machinery for establishing new units should be given.

5.2. If, for a particular State, there be schemes involving the manufacture of (i) special sections exclusively, (ii) common sections alone, they should be considered in that order of preference. Care should be taken to see that no re-rolling mill is allowed to be established in future on the basis of supplies of ingots or billets from Electric Furnaces which are mainly for steel foundries.

5.3. In selecting parties from among the fresh applicants, no doubt the Government of India will, in consonance with their general policy in this regard, give due consideration to—

(a) the financial stability of the applicants.

(b) the competence of the applicants to execute the scheme.

(c) the extent to which machinery can be had locally.

5.4. We also suggest that a party may not be given permission to set up more than one new re-rolling unit.

CHAPTER VI

MATTERS NOT DIRECTLY COVERED WITH THE TERMS OF REFERENCE.

6.1. There are a few matters which, though not specifically covered by the terms of reference, are important enough to deserve mention.

6.2. The existing classification of Re-rollers needs modification. Besides the Main Producers, there are now 3 categories of Re-rollers, *viz.*

(i) Secondary Producers,
(ii) Registered Re-rollers, and
(iii) Un-registered Re-rollers.

We suggest that in future the use of the terms 'Registered' and 'Un-registered' be discontinued and that in future the Re-rollers now falling under these two categories should be re-classified on the basis of the type of raw material they use, *viz.*, billets or scrap.

6.3. Instances have come to our notice where re-rolling mills depending solely on the rolling activities have been finding it difficult to keep in business because of shortage of raw materials or for other reasons. It would improve their lot if they enlarge the scope of their activities by providing for processing or fabricating suitable consumer goods or parts for the manufacture of machinery, equipment, etc., and thereby utilise at least a certain portion of their output.

6.4. As will be seen from Appendix XI, certain States have surplus re-rolling capacity. Typical examples are Punjab, U.P., and West Bengal. In these States, the re-rolling industry is concentrated in a few places only, *e.g.*, Gobindgarh in the Punjab, Kanpur in U.P., and Calcutta in West Bengal. It would be conducive to more economic production and facilitate distribution of the finished products if the industry in the surplus States is dispersed over a larger area within the States in which the re-rolling units are at present operating. Such an arrangement would also relieve pressure on the Railway Transport System.

6.5. We have come across instances where certain industrial undertakings engaged in the manufacture of consumer goods, *e.g.* razor blades and hinges, cannot get the raw material locally, and are, therefore, anxious to provide for their production by installing a special cold rolling mill. Such cases deserve favourable consideration in order to minimise the country's dependence on foreign countries for raw material supplies and to reduce foreign expenditure. We recommend that cases of this type may be considered on merits. Care should, however, be taken to guard against the possibility of advantage being taken by the parties which may be allowed to put up special cold rolling mills, of such an arrangement to claim a hot rolling mill.

CHAPTER VII

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

(1) The existing capacity of the Re-rolling Mills of various categories including Secondary, Producers as on 1st November 1956 is about 700,000 tons per annum on one shift basis. As certain returns need re-checking, the figure should be regarded as provisional.

Recommendation No. 1

All the existing capacity is not covered by valid sanctions. In some cases, the plant and machinery which was mainly for the purpose of replacement has been put up along with plant already in position. Strictly speaking, the capacity created without proper sanction should not be recognised. It would not, however, be in the national interest to ignore the existence of such plant and machinery. (Para. 3.2).

Recommendation No. 2

(2) In addition, some plant and machinery has been licensed by the Iron & Steel Controller to be obtained from abroad or indigenously, mainly for replacement. There is reason to believe that most of the plant and machinery now to be arranged will have the effect of increasing the capacity of the re-rolling units. Such additional capacity has been assessed at 104,760 tons per annum and may be taken as the projected additional capacity. (Para. 3.2).

Recommendation No. 3

(3) While the major part of the existing capacity is based on the use of billets, quite a few units, particularly smaller units, depend on re-rollable scrap for their operation. Re-rollable scrap is not proper material for the manufacture of quality product, but its use will be continued in mills below 8″ sizes. These can operate economically on re-rollable scrap. The capacity of such units which can suitably run on re-rollable scrap is 26,200 tons per annum. The remaining capacity should be taken as based on billets. It comes to 1,325,746 tons on double shift. (Para. 3.3).

(4) No difficulty is anticipated in the mills below 8″ in size getting their future requirements of re-rollable scrap as hitherto. (Para. 3.4).

(5) As regards the units based on billets, a number of such units have had to restrict their operations to single shift or even less. It is generally accepted practice for such units to work double shift to ensure economic production. Allowing for wastage at 10 per cent., their total requirements of billets on double shift, work out to 1,458,024 tons per annum. (Para. 3.4).

(6) The indigenous supplies of billets and imports under liberal policy have not proved sufficient to meet the requirements of the re-rolling industry according to the general practice in the line. (Para. 3.7).

(7) The total anticipated availability of billets and electric furnace ingots for re-rolling purposes by 1960-61 is 890,000 tons a year. This quantity in terms of billets comes to 876,250 tons. (Paras. 3.7 and 3.15).

Recommendation No. 4

(8) Nothing can be said about the quantum of billets that would be available in the near future. Anyway, it is clear that it would not be possible to cater to the entire industry as it exists to-day on two shift basis which represents the general practice in industry to achieve economic production. It would, therefore, be necessary to regulate billet supplies in the manner which more or less maintain the present pattern of distribution (Para 3.7).

Recommendation Nos. 5 *and* 6

(9) In spite of the Government of India's liberal import policy in regard to billets, it was found necessary to obtain from abroad substantial supplies of certain sections for which capacity existed in the country. This points to the conclusion that it is difficult to get billets from foreign countries. Government should, therefore, make a special effort to get from steel producing countries, through trade agreements or otherwise, as much billet supply as possible to supplement the indigenous production to enable the re-rollers to work on an economic basis. At least, it should be ensured that the industry as whole does not get less than what they were given in 1956. (Para. 3.8).

Recommendation Nos. 7 *and* 8

(10) It would take some time to increase the billet production by utilising the scrap available in the country. Meanwhile it would be in the national interest if the mills of 8″ and above are also advised to make use of as much scrap as possible to secure the maximum output. Till such time as the raw material position for the Re-rolling Industry continues to be tight, the Main Producers may be asked to make available to the Re-rolling units scrap at least to the same extent as during the years 1955-56. (Para. 3.9).

Recommendation No. 9

(11) Having regard to the trend of demand for re-rolled sections, we reckon that the demand by 1960-61 will far exceed the estimates given in the Second Five-Year Plan, with reference to the supply position of billets. The advisability of making better provision for billets in the Third Plan period may, therefore, be considered. (Para. 3.10).

Recommendation No. 10

(12) If adequate supplies of billets cannot be arranged, the available supplies may have to be rationed among the re-rollers *pro-rata* on the capacity as recently assessed by the Iron & Steel Controller. In such allocations of billets (i) the units which were given the option recently to change over to billets but preferred to continue to operate on scrap and (ii) the unauthorised capacity will have to be ignored. (Para. 3.11).

(13) Unless supplies for one shift at least are assured to the industry, there would be a danger of larger units having to suspend their operations. (Para. 3.12).

Recommendation No. 11

(14) The re-rolling industry is amenable to regional development. New capacity should be established so as to fill the gap locally as far as possible.

The following States are deficient in re-rolling capacity:

(1) Andhra.
(2) Assam (including Manipur, Tripura and N.E.F.A.).
(3) Bihar.
(4) Himachal Pradesh.
(5) Jammu and Kashmir.
(6) Madras (including Pondicherry).
(7) Madhya Pradesh.
(8) Mysore.
(9) Kerala.
(10) Orissa. (Para. 3.18 and Appendix XI).

(15) The other States have surplus re-rolling capacity. (Para. 3.18 and Appendix XI).

Recommendation No. 12

(16) Minimum economic unit in the re-rolling industry defined. (Paras. 3.21 and 3.22).

Recommendation No. 13

(17) Additional re-rolling capacity in deficient areas should be created by resorting to the following steps in the order mentioned:

(1) The parties which have been allowed to import or otherwise obtain new rolling mills plants may be advised to establish their plants in a State other than the State where there is already over concentration of capacity.

(2) Mills in the surplus (congested) areas may be permitted to transfer their existing plant and machinery to the deficient State.

(3) The existing mills in the State may be permitted to expand their plant suitably.

(4) If the gap cannot be filled up in any one or more of the above ways, permission to obtain new plant and machinery for establishing new units should be given.

Recommendation No. 14

If, for a particular State, there be schemes involving the manufacture of (i) Special Sections exclusively (ii) Special Sections in conjunction with Common sections and (iii) Common sections alone, they should be considered in that order of preference. (Para. 4.9).

Recommendation No. 15

(18) No re-rolling mills should be allowed to be established in the future on the basis of supplies of ingots or billets from Electric Furnaces which are mainly for Steel Foundries. (Para. 5.2).

Recommendation No. 16

(19) For all billets allocated, production orders should be planned by the Iron and Steel Controller in the same way as on the Main and Secondary Producers. (Para. 3.12).

Recommendation No. 17

(20) Future planning of orders should aim at utilising the capacity of the larger mills for meeting the demands for Common Sections which are suitable for mass production and that of the smaller mills for the production of other Sections as far as possible. As large capacity for producing bars and rods, certain sections such as 1/2″ and 5/8″ diameter rounds and squares flats and light structurals is available with the Re-rolling Industry, it would be possible to restrict their production by the major steel plants in the country and to utilise their capacity for bigger sections for which the demand is not fully met. (Para. 4.4).

Recommendation No. 18

(21) While mills below 8″ may continue to base their operations on scrap as at present, they should be ultimately replaced by modern mills operating on billets. (Para. 4.3).

Recommendation No. 19

(22) In a number of mills equipment is obsolescent and ill-balanced. Ultimately, improved efficiency should be aimed at. It can be secured, among other things, by

(a) improved lay-out obtained by re-vamping;

(b) modernisation and balancing of equipment, for example, furnace capacity to the mill proper and the cutting and handling facilities;

(c) providing up-to-date technical know-how and supervision, and

(d) ensuring regular and adequate supplies of raw materials of uniform quality.

Recommendation No. 20

(23) As a long range policy, balanced and modernised plants with effective quality control should be preferred. (Para. 4.3).

Recommendation No. 21

(24) Quality Control in the Re-rolling Industry needs be developed. (Paras. 4.1 and 4.2).

Recommendation No. 22

(25) There is a congestion of small re-rolling mills in certain areas. This is primarily due to the availability of the requisite type of skill locally. It would be of greater advantage if 2 or more of them could be induced to pool their resources and work as a single unit. (Para. 4.7).

Recommendation No. 23

(26) There are some re-rolling mills where the working conditions are not quite satisfactory. Such units should be shifted to better sites, preferably to the Industrial Estates wherever they are being developed. (Para. 4.8).

Recommendation No. 24

(27) Larger mechanised re-rolling units, if given adequate supplies of billets, can pay their way without any 'subsidy'. All such units may

be treated as Secondary Producers. Further there will be no need to give any subsidy to the smaller units provided they get regular supply of billets to work double shift. The entire question of subsidy is now before the Tariff Commission. (Para. 4.9).

Recommendation No. 25

(28) It would improve the lot of re-rolling units if they enlarge their scope of activities by providing for processing or fabricating suitable consumer goods or parts for the manufacture of machinery, equipment, etc.

Recommendation No. 26

(29) Existing classification of Re-rollers should be revised and in future there should be only two categories on the basis of type of raw material used, billets or scrap. (Para. 6.2).

Recommendation No. 27

(30) The advisability of including rolling mill engineering as a subject in the technical colleges and institutes may be considered. (Para. 4.6).

Recommendation No. 28

(31) It would be conducive to economic production, facilitate distribution of finished products and relieve pressure on the transport system, if mills which are concentrated in certain areas in surplus States could be dispersed over a wider area within such States. (Para. 6.4 and Appendix XI).

S. BANERJEE,
Member-Secretary.

B. B. SAKSENA,
Chairman.

L. N. TIKMANY.
R. L. BHARTIA.

Members.

Subject to notes attached.
K. S. RAGHUPATHI.
D. P. DADA.

NOTE OF SHRI K. S. RAGHUPATHI

While I agree with the trend of the recommendations, I consider that Government should carry out a detailed investigation into the nature and size of the demand and of the capacity for production before reaching any conclusions on the future development of the re-rolling industry and the assistance which should be given to it. The demand would require to be assessed by categories. The nature of the products rolled and the costs of production as also what it would cost if there were regular production on an adequate scale would all assist in determining what should be produced by the main steelworks and what by the re-rolling Industry.

2. The re-rolling industry is a necessary complement to the main iron and steel industry. It is useful in meeting demands for special sections, which are different to the standard commercial sections in shape or in composition or both. The demand for these is such that the re-rolling mills can produce them more economically than can the main mills. At this stage of development of the steel industry, care should be taken to see that there is no unco-ordinated or wasteful allocation of resources. Regional development should be with a view to utilise these resources most economically. For instance, it appears that small sections used in building construction are not much in demand in states like Assam and Kerala where timber is available in plenty. On the other hand, the demand both for constructional steel and for special sections for light industries appear to be concentrated near the centres of engineering industry like Calcutta and Bombay. With the establishment of three large integrated steelworks in the public sector and the expansion of the two existing works, the supplies of the smaller sizes of rounds and bars and similar constructional steel will improve considerably. So will the availability of billets for re-rollers. With an increase in the production of steel and the development of industry in general, there would be an increase in demand for special sections. These factors should amongst others, determine the size and location of the re-rolling units. Whatever reasons there might have been for fixing uniform prices at various places for steel and for subsidising the sale of billets to the re-rolling industry, neither of these somewhat artificial circumstances should influence the decision with regard to either the development of the industry or its location.

(Sd.) K. S. RAGHUPATHI.

NOTE OF SHRI D. P. DADA

I agree with the report subject to the following:—

1. Small units which fall under the category of Small Scale and Cottage Industries render a yeomans service as outlined below to the present economy of our country and as such they should be fully encouraged:—

(i) Low initial investment;

(ii) Scope for employment on a mass scale all over the country;

(iii) Flexibility to meet urgent or occasional regional demands at a short notice;

(iv) Wide dispersal which is good for strategic or emergent reason;

(v) Capacity to roll lighter and special section;

(vi) Achieving a balance in price level which could otherwise be manipulated.

2. Till such time when the available raw material is sufficient to feed the two shift 1946 capacity (unchallenged till 1955) of the Re-rollers, no material should be provided to those who have created capacity without proper sanction of the Government or who had given a clear undertaking that such expansion due to replacement will not entitle them to extra raw material.

(NOTE.—After the appointment of the Committee some of the re-rollers have managed licences for the import of the re-rolling plants in replacement of their old plants, with a clear undertaking that such replacement and/or modernization will not entitle them to any extra allocation of raw material or enhancement in their then existing capacity. These re-rollers in the garb of replacement are importing very big plants with a view to increase their capacity.)

3. Allotment to the unauthorised or the imported plants at this stage, when the raw material position is acute and is further likely to deteriorate on account of stringency of Foreign Exchange will further reduce the allocation to as many as 122 small units which have hitherto been hit hard on account of paucity of raw material and disparity in distribution.

Such capacities may be considered at a time when raw material available in the country is enough to meet the present and projected capacities as also improvement by small units which if ignored would not be able to compete with the improved Mills. At present these capacities should only be considered for computation purposes *i.e.* for ascertaining the total potential capacity available in the country.

4. In view of the fact that the rates of sale and purchase of the billet is the same for all billet consuming mills, the distribution of the billet should be *pro-rata* to their capacities.

5. Priority to shift to the areas at present deficient in Re-rolling capacity should as a matter of right be given to the existing Mills in congested areas. This will not affect allocation to the other existing units.

(Sd.) DHARAM PAUL DADA,
Member.

PART II

ELECRTIC FURNACES AND STEEL FOUNDRIES IN INDIA

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CHAPTER VIII

GENERAL OBSERVATIONS

8.1. To understand clearly the nature of the industry we are dealing with, it is necessary to make a few general remarks.

8.2. **Steel Making.**—Pig Iron, Steel Scrap and Iron Ore are the raw materials from which steel is made. Pig Iron is melted for the removal of impurities—carbon, silicon, phosphorus and manganese.

Blast Furnaces of large sizes are used for smelting Ore with coke as fuel, for producing pig iron. Other types of furnaces such as Electric Furnaces are also used for this purpose, but in India they are not generally used. Only the Mysore Iron & Steel Works have Electric Furnaces manufacturing Pig Iron.

The molten metal made from the Blast Furnaces contains, in varying degrees, carbon, silicon, phosphorus and manganese. It is further smelted in Open Hearth Furnaces. Varying percentages of steel scrap are also added to the hot metal. The impurities from pig iron are removed in the process and the refined metal is steel which, after suitable ladle additions, is cast into ingots.* These ingots are taken to soaking pits of the blooming mills where, after reheating, they are passed through the rolls of the blooming mills several times to produce blooms and slabs. Billets which are square sections varying from 2" to 6", in long lengths, are produced from blooms. They are known as 'Semis', the finished products being Bars, Rods, Structurals, etc. 'Slabs' are in the form of thicker flats and are further rolled down to Plates and Sheets.

The molten metal from the Blast Furnaces can also be converted into steel by the Bessemer Converters which are refractory lined steel vessels, the purification being by blowing air through the hot metal in the Converter from the bottom. This process has very limited application in India due to the absence of suitable raw materials.

The process of making steel starting from ore is involved and a plant requires investment of 100 crores of Rupees or more. These units are classified as "Major Producers" or "Main Producers of Steel" and are outside our purview.

8.3. Steel scrap which arises during the various processes of making and shaping and further fabrication and processing of steel ore as a result of wear and tear of steel materials in use, is also converted again into good steel by smelting in furnaces. For smelting, scrap other than that used by Major Producers, Electric Furnaces are generally used: only occasionally small Open Hearth Furnaces are used for the purpose. The plant for making steel from steel scrap is generally a small unit calling for a correspondingly low capital outlay.

Steel from these furnaces is used for two purposes:

(i) For making Steel Castings.

(ii) For making ingots and billets for rolling or forging

8.4. Steel Foundries are units engaged in producing Steel Castings. When they are not able to utilise, for steel castings, the full quantity of liquid metal from their furnaces, the surplus metal is cast into ingots or billets.

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*These are rectangular blocks with a slight taper from bottom to top.

CHAPTER IX

SCOPE OF ENQUIRY AND STATE OF DEVELOPMENT OF ELECTRIC FURNACES AND STEEL FOUNDRIES.

9.1. As stated earlier, steel scrap is generally smelted in Electric Furnaces and occasionally in Open Hearth Furnaces, for making steel castings and/or ingots/billets. Production of castings and ingots/billets and consumption of steel scrap in the works of M/s. Tatas Iron and Steel Co., Ltd., and M/s. Indian Iron & Steel Co., Ltd., are, however, excluded from our enquiry, as they mostly use their own scrap. Ordnance Factories also have been excluded from our enquiry.

9.2. The Steel Foundry Industry is an important auxiliary to the major steel producing industry, and its products steel castings are used largely by the Railways in the manufacture of locomotives, coaches and wagons; by the machine manufacturers, for making important parts of machinery, for power-plants, and steel, cement, sugar, paper, automobile and various other industries; for driving gears and pinions; and for other steel shapes which do not easily lend themselves to the processes of rolling, forging or extrusion.

9.3. In other countries which are industrially advanced and have developed a large demand for steel castings, the entire liquid metal produced by the units is used in steel foundries for making castings. In India, however, it has not been so in all cases. Only a few units use their entire steel production for steel castings. Many use only a portion of it. The surplus liquid metal is cast by them into ingots for rolling into bars, rods, etc., for which they have put up rolling mills also. The quantity of ingots made by such units for their Rolling Mills, however, falls short of the actual requirements of the mills. These mills have, therefore, to depend considerably on other sources of supply of billets.

CHAPTER X

RAW MATERIALS REQUIREMENTS OF ELECTRIC FURNACES AND STEEL FOUNDRIES: POSSIBILITIES OF EXPANSION OF THE INDUSTRY AND THE AVAILABILITY OF RAW MATERIALS [TERMS OF REFERENCE (a), (c) and (d)].

10.1. The raw material requirements are closely linked with the capacities of the Electric Furnaces and Steel Foundries. We, therefore, proceed with the study of the capacities in detail.

10.2. **Capacity of Steel Furnaces—Present and future.**—There are at present 29 furnaces in India—6 Open Hearth Furnaces and 23 Electric Furnaces. Their rated capacity is about 200,000 tons per annum, but some of the furnaces have not yet come into full operation. The effective capacity is only about 150,000 tons of liquid steel per annum.

Sanctions have been given by the appropriate Government authorities to quite a few new parties for the installation of new furnaces, the total annual capacity being over 200,000 tons according to the claims made by the applicants. Examining the proposals, we find that in most cases the tonnage figures for a given plant have been exaggerated far beyond the capacity of the projected plant.

Many of the schemes are not likely to materialise, as they have been apparently initiated without much thought regarding the suitability of their location, availability of power and raw materials. We expect that against the licences issued capacity of not more than 50,000 tons per annum will materialise.

Hence we estimate that the total liquid metal capacity of steel furnaces present as well as future will be as under:

	Tons per annum.
(1) Present	150,000
(2) Development of existing furnaces . . .	50,000
(3) Projected capacity	50,000
TOTAL .	250,000

10.3. **Capacity of Steel Foundries for castings—Present and future.**—The following Steel Foundries are in operation at present:—

Steel Foundries	*Remarks*
(1) Burn & Co., Ltd., Howrah.	
(2) Kumardhubi Engineering Works, Ltd., Kumardhubi.	
(3) Bhartia Electric Steel Co., Ltd., Calcutta	Those have Rolling Mills in addition.
(4) J. K. Iron and Steel Co., Ltd., Calcutta, Kanpur	
(5) Krishna Steel Industries Ltd., Bombay.	
(6) Mukand Iron and Steel Works Ltd., Bombay.	
(7) Mysore Iron and Steel Works, Bhadravati.	
(8) National Iron and Steel Co., Ltd., Calcutta. .	
(9) TEXMACO, Calcutta	Making ingots also for sale.

In a report submitted by the Railway Equipment Committee in May 1956, the capacity of the above units excluding TEXMACO was estimated to be 21,000 tons of Steel Castings per annum, to be increased to 27,000 tons by 1960. We, however, observe that some of the steel foundries have already exceeded the targets previously fixed and they are planning further expansions.

Our estimate of their capacity by 1960-61 is 36,000 tons per annum. These foundries should be encouraged to expand.

Besides these, 3 large steel foundries have been planned as under:—

	Tons per annum
(1) Tata Locomotive and Engineering Co., Ltd. .	12,000
(2) Chittaranjan Locomotive Works . . .	6,000
(3) Heavy Industries Plant in the Public Sector .	15,000
TOTAL .	33,000

In addition, a number of steel foundries have been licensed, their total capacities being approximately 34,000 tons per annum as estimated by the Railway Equipment Committee. We do not expect that more than 50 per cent. of the capacity will materialise by 1960-61. The total expected capacity of steel foundries, for steel castings will be as under:—

(1) Existing foundries	36,000 Tons.
(2) Three large foundries under erection or projected	33,000 „
(3) Miscellaneous small projects	17,000 „
TOTAL .	86,000 Tons.

10.4. **Raw Materials.**—The tables below show the quantity of scrap supplied to Electric Steel Furnaces for melting from controlled sources and scrap exported.

Scrap supplied to Electric Furnaces from controlled sources.	Tons	Scrap Exported	Tons
1952	55,126	1952-53	480,980
1953	48,847	1953-54	250,000
1954	51,410	1954-55	118,000
1955	50,000	1955-56	186,000

Figures of scrap exports do not give any correct indication of the normal availability of such scrap. The year 1952-53 should not be regarded as a typical year, as exports were predominantly the result of past accumulations. We can take the overall average of the exports of the years 1953-54, 1954-55 and 1955-56 as a fair indication of the tonnage of scrap of particular category available for export. This works out to 185,000 tons per annum.

According to the report made available to us by the Scrap Investigation Committee appointed by the Iron and Steel Controller, the estimates of the availability of Melting Scrap (*i.e.*, other than re-rollable and industrial scrap) are as under:—

	Tons
1957	200,000
1958	215,000
1959	220,000
1960	240,000
1961	260,000

Besides this, they have estimated that Grades[*] 2 and 3 qualities of scrap, which are at present considered unfit for use by the Electric Steel and other small furnaces in the country and are, therefore, exported, would be about 200,000 tons per annum rising to 250,000 tons by 1961. Over and above this, detinned scrap which is also considered unfit for melting at present, has been estimated as 15,000 tons per annum.

10.5. **Estimates of the availability of steel scrap after 1960-61.**—We have no means of estimating the availability of scrap after 1960-61. We may adapt the U.K. pattern to the Indian conditions.

In U.K. in 1955-56, the scrap availability, excluding main producers' scrap, was as under:—

Process scrap	2,300,000 tons (17% of finished steel consumption).
Capital Scrap (scrap returned after use of Capital goods)	2,000,000 tons.
Re-rollers scrap	600,000 tons.
TOTAL	4,900,000 tons.

This works out to 1/4th of the total ingot production of that year in U.K. India cannot reach that level until effective arrangements are made to get more process scrap and capital scrap from consumers.

The Scrap Investigation Committee has estimated the availability of scrap in India during 1955-56 at 400,000 tons.[†] In that year, India consumed 1,800,000 tons of finished steel. This, converted into ingots, would amount to 2,400,000 tons. The figure of 400,000 tons of scrap from this quantity of ingots works out to 1/6th of the total ingot equivalent. This may, therefore, be taken as a safe basis for estimating the future availability of scrap in India after 1960-61.

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[*] No. 2 consisting of rusty and old iron and steel sheet cuttings and/or punchings thinner than 1/8" including condemned manufactured articles of black sheet metal and/or ungalvanised wires and auto body scrap. Such bales should contain no fresh or unoxidised black sheet cuttings and/or punchings or articles made thereof.

No. 2-A consisting of unserviceable old and used rusty and condemned articles of iron and steel wire and/or sheet (thinner than 1/8") badly pitted and corroded sheet metal including auto body and fender scrap. Such bales should contain no fresh or unoxidised black sheet cuttings and/or punchings unless used as one covering or binding materials.

No. 3 consisting of old and used rusty and condemned unserviceable iron and steel wire and sheet metal articles, galvanised, and/or enamelled, galvanised sheet cuttings or sheet scrap or cuttings and condemned manufactured articles, destructor scrap and all other rotten materials.

[†]

Process Scrap (10% of finished steel consumption)	T. 180,000
Capital Scrap	T. 200,000
Re-rollers Scrap	T. 20,000.

The ingot production after 1960-61 is expected to be 6 million tons per annum. Reckoned at 1/6th of ingot production, the total amount of scrap available by that year will be 1,000,000 tons per annum. Already 400,000 tons of scrap is available at present. This means that another 600,000 tons of scrap would be available after 1960-61.

We may, however, point out here that all this scrap will not be available immediately after 1960-61. The amount of scrap will depend on the pace at which the industrial activities grow in the country. As the Railways and major industries replace worn out machinery and equipment, the quantum of scrap classified as 'capital scrap' will increase.

Taking all these into consideration, it would be safe to assume that the scrap that would be available annually by the end of five years period 1961-62 to 1965-66 will be of the order 600,000 tons over and above 400,000 tons now available.

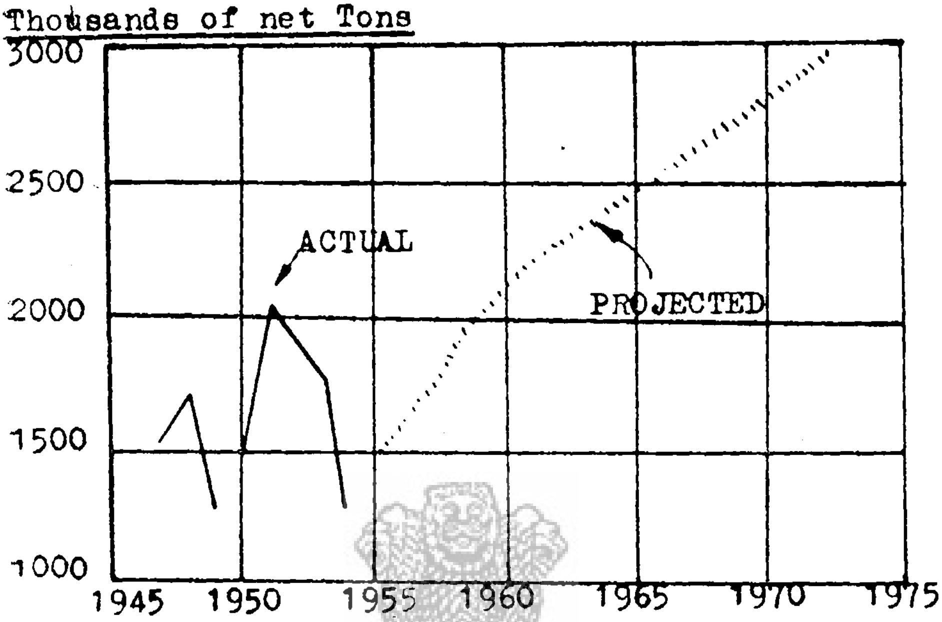
10.6. **Assessment of additional capacity for steel castings desirable to set up in the light of the development in the country.**—According to the Railway Equipment Committee, by 1960, 41,500 tons of steel castings will be required by the Railways for wagons and coach building, locomotive building and rolling-stock maintenance. No figures of requirement of steel castings for other industries were given by them.

In the absence of information in this respect, we can estimate the requirements of steel castings, on the analogy of industrially advanced foreign countries such as the U.S.A.

We give on the following page 2 charts showing the total shipment of Steel Castings and Steel Casting Markets, in the United States of America.

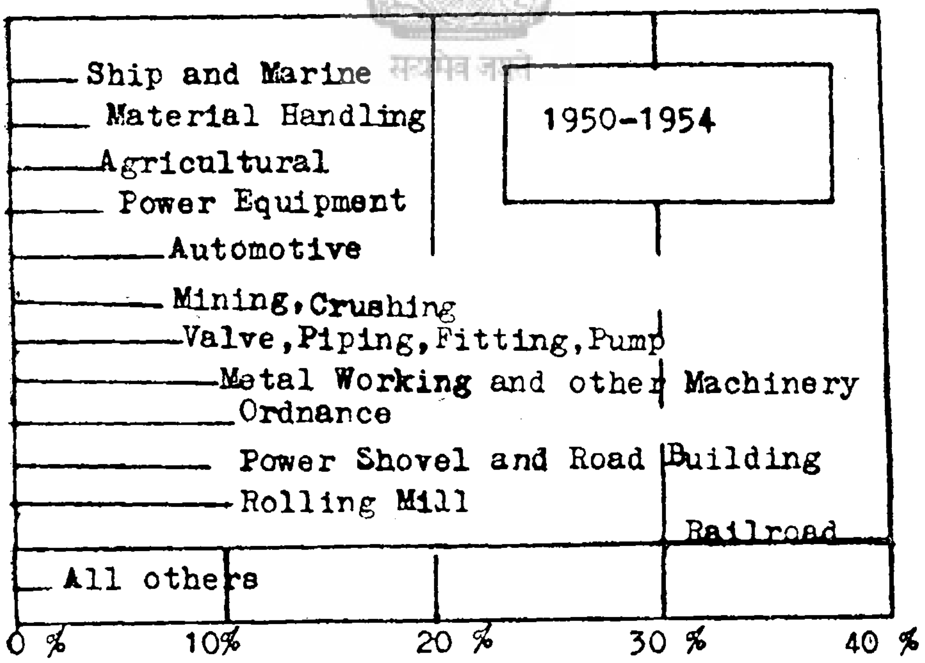
TOTAL SHIPMENTS OF STEEL CASTINGS

Including castings for sale and for own use



STEEL CASTING MARKETS

(*Based on five year Average*)



It will be seen that the railroads are the biggest consumers of steel castings, their consumption being 40 per cent. of the total consumption of steel castings. In America the consumption of steel castings amounted to approximately 1·5 million tons in 1955 against the steel ingot production of 105 million tons, or roughly 1·5 per cent. The consumption of steel castings in England also in relation to the consumption of steel in the country works out at 1·5 per cent. of the ingot production per annum. Taking the same pattern for India, the demand for steel castings based on an anticipated production of 6 million tons of ingot steel by 1960-61 would work out to 90,000 tons per annum. As, however, the consumption in India may not be as high as in America for power shovels, automatic tools, agriculture and ordnance, it would, in our opinion, be reasonable to assume that our consumption would be about 20 per cent. less than the American averages or say 72,000 tons per annum for 1960-61. Out of the 72,000 tons roughly 36,000 tons will be consumed by the Railways and the balance for various purposes. We can, therefore, assume that with 6 million tons of ingot steel available by 1960-61, the finished casting production and consumption will be of the order of 72,000 tons per year.

The total steel foundry capacity by 1960-61 would amount to 86,000 tons. This would be sufficient to take care of the estimated annual demand of 72,000 tons of steel castings by that period. Therefore, there does not appear to be any necessity to create any additional new steel foundry capacity upto 1960-61.

10.7. **Assessment of additional capacity for billets in the light of development in other sectors of the economy of the country.**—While there is no scope for establishing new units for steel castings, there is definitely a need in the country to set up additional steel furnaces, for the manufacture of steel ingots or billets, for meeting the needs of the Steel Re-rolling industry. We have already assessed the annual liquid steel capacity as 250,000 tons and the melting scrap availability as 260,000 tons by 1960-61. This would hardly be sufficient to meet the needs of the existing and projected Steel Furnaces, as actual requirements of scrap would be about 285,000 tons a year.

10.8. At present, the average annual exports of scrap from India come to about 185,000 tons. It pertains to grades 2 and 3. By 1960-61, the amount of such scrap is expected to increase to 250,000 tons a year. For the period 1961-62 to 1965-66, we envisage that a further annual supply of 300,000 tons of such scrap would be available out of the total annual additional supply of 600,000 tons envisaged.

All this scrap is not of the same kind or quality. There may be about 20 per cent. very light scrap which it would not be economical to transport to distant places. It would amount to about 50,000 tons. Some additional supplies of other types of scrap may also be available for use locally along with very light scrap. It is estimated that there are five million bullock carts in the country and on an average each bullock cart will use about 140 lbs. of steel material distributed as follows:—

Two pieces of flats 2″ × 7/16″ × 18′ for the wheel tyres weighing .	108 lbs.
One axle 1·5/8″ sq. × 3′ weighing	27 lbs.
Flats for the rims of wheel centres and cotters for holding wheels in place weighing.	5 lbs.
Total . .	140 lbs.

So, for 5 million carts in the country approximately 312.500 tons of steel is required. Assuming the average replacement once in 5 years, 62,500 tons of steel would be required per annum, and basing the return scrap at 40 per cent. 25,000 tons will be available every year distributed all over the country. Again there are over 15 million bullocks in the country and each bullock has to be shoed with 8 shoes weighing in all about ½ a lb. and the shoeing has to be monthly, and each bullock would use 6 lbs. of steel per annum. For 15 million bullocks the requirement is 90 million lbs. per annum or, in other words, the amount of steel required under this head is 40,000 tons per annum. The worn out shoes will be roughly half, *i.e.*, 20,000 tons per annum. Again, nails are used all over the country and the consumption is in the order of 40,000 tons per annum. Assuming the return on this to be 50 per cent. 20,000 tons of scrap would be available every year. Thus even on these small items as parts of bullock carts, bullock shoes and nails the return scrap should total 62,5 0 tons per annum. Besides wire products are used all over the country and the return scrap from wires will be another 10,000 tons a year. Scrap of box strappings, cotton baling hoops, etc., would be distributed all over the country and the return scrap under this head would amount to about 10,000 tons a year. Taking all this into consideration, this type of scrap amounting to in all 80,000 tons or so will be distributed all over the country more or less based on a population basis. It can be formed into very light bales in suitable presses and converted into liquid steel to be cast into billets in Mains Frequency Induction furnaces in sizes ranging from 2 to 4 tons with a monthly capacity of 150 to 300 tons of liquid steel. According to our rough reckoning, such scrap can sustain 15—20 furnaces of that type in areas where it arises.

About 80 per cent. of the scrap now being exported will be of a category distinct from very light scrap. It would include light sheet cutting scrap unserviceable old and used condemned articles of iron and steel wire and autobody scrap. Such scrap can be baled in hydraulic presses to compact bundles. For converting this kind of scrap into billets and to make billet production economic, the latest method of continuous casting of steel billets, may be adopted. A unit capable of producing 50,000 tons of billets per annum should be regarded as an ideal unit, but smaller units, say, capable of producing 20,000—25,000 tons of billets per annum can also be economic units. The electric furnace to be used for this purpose should be correspondingly large. Possibilities of using hot blast cupolas combined with converters or electric furnaces should also be examined by the prospective enterpreneurs in this connection. Such schemes will, however, be costly. An electric furnace complete with a continuous billet casting unit will cost as much as Rs. 1·5 crores. In actual practice, it may be difficult for individual private parties to come forward to put up such units without suitable financial assistance. In certain cases, it may be possible to set up such units as co-operative ventures—a group of Re-rollers combining together for the purpose. Where such an arrangement is not feasible, the Government should consider and advise the interested parties how the financial difficulties can be overcome.

10.9. **Economics of the manufacture.**—There is no doubt that in Electric Furnace plants set up for the manufacture of billets, the manufacturing cost of billets will be higher than that of the main producers. But taking freight advantage into consideration, the difference may be considerably reduced. In any case, the cost of these billets will be lower than the imported billet prices. The shortage of steel in the country will continue till the end of the third 5 Year Plan, if not longer. During this period such plants will, besides creating new avenues for employment and meeting the needs of the re-rolling industry, save valuable foreign exchange. Any future plans for the development of the steel industry should provide for the continuance of such billet plants as might be put up in the present conditions.

The total quantity of scarp available by 1960-61 being about 250,000 tons, plants for the production of approximately 150,000 tons of billets can easily be put up. For the period 1961-62 to 1965-66, we are envisaging the possibilities of an additional supply of 600,000 tons of scrap per year. If this can be all used up, a further half of a million ton of billets can be produced to feed the re-rolling industry.

10.10. At present some of the scrap arising in the rural areas is used by village black-smiths. When the local scrap is converted into billets, the black-smiths will get better material for their needs.

10.11 We understand that the Mysore Iron & Steel Works propose to expand their steel melting capacity by adopting the Linz (L.D.) process for producing 70,000 tons of steel and another 30,000 tons utilising scrap in a new 25 ton electric furnace. In the Linz process they expect to consume 15 per cent. scrap and they will have 80,000 tons of pig iron available for steel making over and above 25,000 tons required for their Pipe and General Foundries. As much as 40,000 tons of scrap would be used annually under this plan as against 30,000 tons they used during the year 1956. We, therefore, suggest that Bhadravati may consider the desirability of using high grade low phosphorous iron ore which, we understand, they have discovered in Chitaldurg area, for cooling the metal in the Linz Process and utilise the scrap arising from their own plant in addition to the purchased scrap to increase electric furnace production to 50,000 tons per annum. Bhadravati is in the advantageous position of being able to produce cheap electric steel because of the very low cost of current in Mysore. We would, therefore, recommend their expanding electric furnace capacity to 50,000 tons instead of 30,000 tons and supplying 15,000 tons of billets from the additional 20,000 tons of ingot capacity to the Re-rolling mills in the South. The foregoing is on the basis that the 5 major steel works will neither buy nor sell any scrap.

CHAPTER XI

WAYS AND MEANS OF IMPROVING THE EFFICIENCY OF STEEL FOUNDRIES AND ELECTRIC FURNACES [Terms of Reference (o)].

11.1. **Improving the economy of Steel Foundries.**—The Steel Foundries should aim at utilising practically the entire quantity of the liquid metal for the production of castings only. Ingots or billets need not be produced except when there is a left-over of surplus liquid metal after meeting the casting requirements. Such occasions would be rare. No Rolling Mills should be established in the future on the basis of supplies of ingots or billets from furnaces which are mainly for steel foundries.

The Steel Foundries should modernise to achieve large-scale production, utilising their full melting capacity for foundry purposes only.

Modern sand treatment and sand recovery plants are good adjuncts to all medium and large sized foundries. Further extension of metallurgical controls, for the production of general and quality castings is advisable.

11.2. **Collection and sorting of scrap.**—In industrially advanced countries of the world, the steel scrap trade is fairly well-organised. This involves collection of scrap from various parts of the country, sorting this out properly from the point of view of direct use and in certain cases processing this scrap to make it suitable for melting. This processing may involve detinning of tin plate scrap, pressing into compact bales of suitable size of light thin sheet cuttings and other scrap cutting or pressing all heavy scrap into chargeable sizes and so on. Sorting of the scrap is also made in such a way that a fair estimate of the analysis of ingredients in the steel is known. The prices of different types and qualities of scrap are fixed on the merits of each and the steel manufacturers know what they are buying. This will help to reduce the melting time in the furnaces with resultant economy.

11.3. In India the classification followed at present under the control, needs considerable modification. The Railways are the largest scrap producers at present, and the sorting of scrap in the Railway Depots could be done on a scientific basis. The collection of scrap from other sources, sorting and processing the same would require the development of an organised scrap trade. The establishment of such a trade should be actively encouraged and supported by the Government and the industry.

At present, large quantities of good melting scrap are being diverted for other uses such as rolling into Bars and Rods or the fabrication of articles, for which this scrap is not ideally suited. With increased availability of steel in future, the use of scrap for this purpose will decline. It would be advisable if the Government revise the present instruction in regard to scrap disposal. Clearly indentifiable items of scrap should be scheduled under the category of industrial or re-rollable scrap and the balance classified as melting scrap only. Good re-rollable scrap will be rails, axles and bars, free from holes and blemishes and industrial scrap can be old springs, cut pieces of tyres and clean plates and sheets. All the rest should be classified as melting scrap and properly processed for consumption by steel furnaces.

If necessary, the Iron and Steel Controller may be requested to reconsider the whole scrap classification schedule and issue instructions in the light of the above observations.

At present, turnings and borings are channelled to the Steel Foundries in a rather haphazard manner. The only economic way in which turnings and borings can be used by steel foundries is to establish a working arrangement between the Major Producers of Borings and Turnings and the Steel Foundries, thereby eliminating sale by auction. By crushing or compacting all turnings and borings at source, considerable freight saving will be effected, the deterioration of the material avoided and the Electric Furnaces can use larger percentage of turnings and borings in their charge. The possibilities of the larger shops producing quantities of turnings and borings, erecting equipment for crushing or compacting borings should be studied.

There is a general belief that cast iron borings cannot be successfully melted in the cupola and are no good for the electric furnace. They are, therefore, being wasted at present. It will pay to collect all the cast iron borings and electric furnaces can use in their charge easily up to 10 per cent. of cast iron borings and these will off set the badly rusty steel scrap charged. Use of oxygen helps and speeds up heat- utilising cast iron borings and results in considerable economies.

11.4. **Silica Sand.**—Silica sand is another important material required by the Steel Foundry Industry. On account of its high silica content good sand has high refractory qualities to withstand the high temperature of liquid steel poured into moulds. There is no organised trade in India as in other industrially advanced countries where the trade offers quality sands of high silica and low iron and alkali contents, free from clay, in various grain sizes. Such arrangements should be developed in India.

11.5. **Graphite Electrodes.**—One of the most important requisites for the Electric arc furnaces is Graphite Electrodes and these are entirely imported from abroad. The manufacture of Electrodes is a highly specialised business. With the anticipated increase of the number of Electric arc furnaces during the next five year period, the demand of electrodes will go up many times. Government should study the possibilities of the setting up of a plant for the manufacture of graphite electrodes in the country, with the technical co-operation of one of the leading manufacturing nations. These are U.S.A., Germany, Italy and Japan. Such a plant would also be able to manufacture graphite, carbon and amorphous carbon electrodes required by electro-chemical, ferro-alloy and electrical industries, etc.

11.6. **Research.**—The National Metallurgical Laboratory at Jamshedpur has already undertaken certain researches on sand for the Steel Foundry purposes. Further and more intensive research should be undertaken by the Government and other Laboratories on the suitability of sands available in the country for steel foundry purposes. Also, research should be carried out on bentonite and other binders used in the preparation of synthetic sand for foundry use. The deposits of good Bentonite are scarce in India and the Geological Department should undertake to locate fresh areas. Research on Shell Moulding and Co 2 Process should also be carried out. Some use of these two processes on production basis has been evolved in India but more intensive research and development and adoption is desirable.

11.7. **Transport and freight rates.**—Transport facilities and freight rates on steel scrap and silica sand should require special consideration. The initial value of these items at the source of availability is nominal. The difficulty in obtaining suitable transport facilities and high freight rates make these raw materals very costly to the users by the time they reach factory premises. As over 70 per cent. of the total manufactured steel castings is used by the Railways, any facilities rendered would mainly benefit the Railways.

CHAPTER XII

PRINCIPLES TO BE FOLLOWED IN LOCATING NEW SITES FOR PROPOSED ELECTRIC FURNACES AND POSSIBILITIES OF ADDITIONAL STEEL CASTING UNITS.

12.1. We have already mentioned that India exports about 185,000 tons of Grades 2 and 3 scrap per annum on the average. Of the scrap exported about 20 per cent. is very light scrap and if retained in the places where such scrap is produced it is possible to use it locally. Besides the kind of scrap now exported, the following types of scrap arise throughout the country:

	Estimated availability Tons per annum
(*i*) Used wheel-tyres and axles from bullock carts . .	25,000
(*ii*) Worn out Shoes of Cattle	40,000
(*iii*) Old wire nails	

These kinds of scrap by their very nature would be available in all parts of the country broadly in proportion to the population. They cannot, however, be used directly in the electric furnaces in the country at present.

12.2. On the other hand, scrap such as auto-bodies, roof sheets returned from various factories, godowns, materials from wagons and locomotives and most material coming from tinplate, would be largely available in and about cities and railway centres. We visualise that the heavier type of scrap would be available near-about cities like Calcutta and Bombay Indeed, large quantities of melting scrap would be available wherever heavy industries are set up in the form of Structural Shops, for the building of locos, wagons, etc. We cannot now say where the industrial activities would grow in the near future, but it would be reasonable to assume that such industries would be set up near the centres of consumption.

12.3. The aim should be to convert the scrap now going out of the country into billets for the use of re-rolling mills. For this, suitable types of electric furnaces should be set up. The concentration of re-rolling mills is in the following order:

(1) Calcutta area.
(2) Punjab.
(3) Bombay.
(4) Kanpur.

Taking into consideration the possibilities of obtaining large quantities of scrap, the obvious centres where big electric furnaces and plants to produce billets can be set up are (1) Calcutta, (2) Bombay and (3) Kanpur, depending upon the pace of development of industries. To begin with an electric furnace should be allowed to be set up at each of these places. In the Punjab, a large number of rolling mills are using re-rollable scrap directly. We are not, therefore, recommending big electric furnace plants for this region.

12.4. A large percentage of light scrap now reaches the ports of Calcutta and Bombay mainly from Uttar Pradesh, the Punjab, Bihar and Delhi. Such light scrap can be used in the regions where it arises. It can be melted in Mains Frequency Induction furnaces and converted into billets for the re-rolling mills in the areas. The general survey we have been able to make of the country within the time at our disposal points to the conclusion that there is scope for putting up at least one such furnace in each of the States as recently reorganised. There may be room for putting up more than one such furnace in the following areas:

Bihar.
Bombay (Sholapur Area).
Delhi.
Madras.
Punjab.
Rajasthan.
U.P. (Eastern Region).

12.5. We, however, suggest that before any permits or licences for electric furnaces are given, a careful assessment of the availability of scrap in and around the proposed sites should be made.

After the expansion of the Steel Industry, most of the additional scrap will be available in Centres where new Engineering and other processing industries are set up. Hence the new plants should be located in the vicinity of such centres of industry.

12.6. The main criteria for the selection of sites should be:

(1) The availability of scrap in large quantities
(2) Cheap electric power.
(3) Re-rolling capacity in the area to utilise the billets produced in the electric furnace plants.

12.7. The primary object of setting up the Electric Furnace plants is to make additional quantities of billets available to the re-rolling mills industry, and therefore wherever proposals are received to locate furnace beside the re-rolling mills, such proposals should be welcomed.

12.8. It has already been pointed out that the existing and projected capacity for steel castings in the country would take care of all the demands for steel castings up to the year 1960-61. No new steel foundries need, therefore, be licensed for casting purposes till 1960-61. Thereafter, the position may be reviewed in the light of the demand for steel castings at that time.

CHAPTER XIII

MATTERS NOT DIRECTLY COVERED BY THE TERMS OF REFERENCE

13.1. Earlier, we have suggested that, as a long-term policy, it would be advisable to set up Electric Furnaces of suitable types for the conversion of Grades 2 and 3 scrap now being exported, into billets for the use of the Re-rolling Industry. We realise that it would take some time—a couple of years—to arrange for the supply of and erect, such Electric Furnaces. In the meantime, it would be advisable to allow the organisations which have already been established in the country and are engaged in the collection of scrap throughout the country, to continue to function undisturbed, so that when Electric Furnaces are set up in the country, scrap might be available without any difficulty. This can be best ensured by adopting a flexible export policy for scrap. As hitherto, a ceiling may be fixed for export of such scrap for each half year having regard to the number of Electric Furnaces that come into being and their requirements of scrap. The present practice of requiring the parties interested in the export of scrap to make available to electric furnace owners a specified percentage of scrap, is wholesome and should be continued.

13.2. At present, the controlled internal prices of scrap are very much lower than those at which it can be sold in foreign countries. It is, therefore, understandable why a large number of parties seek export licences. While it is the policy of the Government of India to allow only that scrap which has been declared to be unusable in the country to go out of the country, the possibilities of better scrap also being exported under the garb of unusable scrap cannot be ruled out altogether. We, therefore, consider that it would be in the national interest to decontrol scrap and let it find a price level through normal trade channels.

CHAPTER XIV

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

(1) The estimated total liquid metal capacity of steel furnaces, existing and projected, will be 250,000 tons by 1960-61, and this should be utilised both for castings and for the production of ingots or billets. The melting scrap expected to be available by 1960-61 would be 260,000 tons per year. This would hardly be sufficient to meet the needs of the existing and projected Steel Furnaces, as their actual requirements of Scrap would be about 285,000 tons a year. (Para. 10.2 and 10.7).

Recommendation No. 1

(2) The capacity of the existing steel foundries is 21,000 tons per annum. They expect to increase their capacity to 36,000 tons per annum by 1960-61. *These foundries should be encouraged to expand and to utilise all their liquid metal for castings purposes only.* (Para. 10.3).

Recommendation No. 2

(3) The estimated demand for steel castings by 1960-61 is 72,000 tons per annum and the steel foundry capacity is expected to be 86,000 tons by that time. This will take care of the entire demand for steel castings. *Therefore, there is no need to create any additional casting capacity before* 1960-61. *The position should be reviewed thereafter.* (Paras. 10.6 and 12.8).

(4) The estimated availability of melting scrap (other than re-rollable industrial scrap) now is 200,000 tons per annum. This together with about 200,000 tons now being exported makes up a total of 400,000 tons, and with the ingot production of 6 million tons per annum after 1960-61, the expected availability of scrap by 1961-62/1965-66 is expected to be 1.000.000 tons *i.e.*, 600,000 tons over and above the 400,000 tons. (Para. 10.5).

Recommendation No. 3

(5) There is definitely a need in the country for additional steel furnaces for the manufacture of steel ingots or billets for meeting the needs of steel rolling industry. By 1960-61, 250,000 tons of Grades 2 and 3 scrap, now being allowed to be exported, will be available. 20 per cent. of this scrap is comprised of very light varieties, which arise in all parts of the country. Besides, other types of light scrap can be had throughout the country. Efforts should be made to use such scrap in the regions where it arises. In all, about 80,000 tons of this type of Scrap would be available per year. Mains frequency induction furnace with monthly capacity of 150/300 tons should be set up to convert this scrap into billets for rolling mills at least one in each State and more than one if an assessment of scrap availability warrants such addition. Balance 80 per cent. of the scrap should be pressed into compact bales in power hydraulic presses and should be converted into steel in big mechanically charged electric furnaces and converted into billets by adopting the method of continuous castings.

Recommendation No. 4

Such large furnaces can be installed in Bombay and Calcutta to begin with. (Paras. 10.8, 10.9, 12.3, 12.4 and 12.5).

Recommendation No. 5

(6) If individual private parties or Co-operatives find it difficult to put up such large electric furnace plants, Government should assist the parties in overcoming the financial difficulties. (Para. 10.8).

(7) If the scrap of the types exported at present is utilised in electric furnaces, 150,000 tons of billets can be made available to the re-rolling mills per annum. (Para. 10.9).

(8) The additional scrap estimated as available in the period 1960-61/1965-66 is 600,000 and if all of this additional scrap can be utilised in electric furnaces for producing billets an additional 500,000 tons of billets will be available per year. (Para. 10.9).

Recommendation No. 6

(9) Any future plans for th edevelopment of the steel industry should provide for the continuance of electric furnace plants that might be put up in present conditions for billet-making. (Para. 10.9).

Recommendation No. 7

(10) It is suggested that the Mysore Iron & Steel Works may expand their electric furnace capacity to 50,000 tons instead of 30,000 tons a year and supply 15,000 tons of billets to the Re-rolling mills in the South. (Para. 10.11).

Recommendation No. 8

(11) Until the furnaces are erected to utilise the scrap exported at present, permits may be given for export, subject to review every six months and the exporters making a certain percentage available to electric furnaces. Eventually the export should be stopped. (Para. 13.1).

Recommendation No. 9

(12) Scrap should be de-controlled, so that it may find a price level through normal trade channels. (Para. 13.2).

Recommendation No. 10

(13) Steel foundries should modernise to achieve large scale production utilising their full melting capacity for foundry purposes only. (Para. 11.1).

Recommendation No. 11

(14) The classification of scrap followed at present under the control needs considerable modifications. Fairly indentifiable items of scrap should be classified under the category of industrial or re-rolling scrap; the balance as melting scrap only. (Para. 11.3).

Recommendation No. 12

(15) Borings and turnings should be canalised to the steel foundries by establishing a working arrangement between the major producers or borings and turnings and steel foundries or by pressing or compacting this at source to avoid deterioration of the material. (Para. 11.3).

Recommendation No. 13

(16) An organised trade should be developed for supply of high grade silica sands of low iron and alkali contents. (Para. 11.4).

Recommendation No. 14

(17) The possibilities of the setting up of a plant for manufacture of graphite electrodes should be explored with the technical assistance of a leading foreign country in the field. (Para. 11.5).

Recommendation No. 15

(18) Intensive research on the suitability of silica sands, bentonite and other binders should be undertaken. (Para. 11.6).

Recommendation No. 16

(19) Transport facilities and freight rates for steel scrap and silica sands should receive special consideration. (Para. 11.7).

S. SAMBASIVAN,
Chairman.

H. M. CHATTERJEE
D. M. SEN
R. M. AGRAWAL
Members.

V. DORASAMY,
Secretary.

CHAPTER XV

GENERAL REMARKS BY THE COMMITTEE

15.1. We endorse the conclusions and recommendations of the Sub-Committee on (i) the Steel Re-rolling Industry and (ii) Electric Furnaces and Steel Foundries.

15.2. We have taken much longer time than was allotted to us by Government for studying these industries and submitting our report thereon. The delay calls for an explanation. Several factors were responsible for it. Firstly, no reliable information regarding the existing capacity of the re-rolling units in the country was available, and we had to institute fresh enquiries in this regard. Secondly, no assessment had been made of the availability of scrap. Thirdly, the personnel of the Committee who were drawn from distant places, were expected to take part in this enquiry, in addition to their normal duties. It, therefore, became difficult for them to get together as frequently as they would have wished, for visiting important industrial centres, for discussing salient points connected with the enquiry and setting out the outline of the Report.

15.3. **Acknowledgments.**—We wish to place on record that in the course of our enquiry we received full co-operation and valuable assistance from the Directors of Industries and other State Authorities, managements of Steel Foundries and Re-rolling Mills, Scrap Exporters, Railway Authorities, the Steel Re-rolling Mills Association of India, the Engineering Association of India and Chambers of Commerce and Industrial Associations in various States. We are indebted to them all.

Our sincere thanks are also due to Shri C. R. Natesan, Iron and Steel Controller, and Shri R. N. Dutt, Deputy Iron & Steel Controller, who, in the midst of multifarious duties, managed to find time to attend some of our meetings and freely placed at our disposal their extensive knowledge and experience of these industries.

We are also grateful to the Scrap Investigation Committee presided over by Shri R. N. Kapur whose report gave us a comprehensive idea of the availability of steel melting scrap now and in the near future.

Finally, we wish to place on record our appreciation of the excellent and hard work done by Shri S. Banerjee, Member-Secretary of the Committee and Shri V. Dorasamy, Secretary of the Sub-Committee on Electric Furnaces and Steel Foundries. The Staff engaged on our Committee's work ungrudgingly put in hard work and unduly long hours and they also deserve our thanks.

S. BANERJEE,
Member-Secretary.

B. B. SAKSENA,
Chairman.

S. SAMBASIVAN
R. M. AGRAWAL
D. P. DADA
Subject to note attached.
K. S. RAGHUPATHI
} *Members.*

NOTE OF SHRI K. S. RAGHUPATHI

In addition to what I have said in Part I of the Report on the Steel Re-rolling Industry, I would only emphasise that in deciding the size and location of electric furnaces, particularly for the manufacture of billets, the cost of manufacture in electric furnaces *vis-a-vis* the cost of manufacture in integrated steel works should be taken into account. A view must also be taken about the use of scrap in the country. In certain circumstances, it might not be worthwhile converting this scrap in electric furnaces. There might be better uses for it elsewhere.

(Sd.) K. S. RAGHUPATHI.

APPENDICES

APPENDIX I (*a*)

Press Note, dated 11th April, 1956, issued by the Ministry of Commerce and Industry, Government of India.

PRESS INFORMATION BUREAU

GOVERNMENT OF INDIA

PRESS NOTE

Development of Steel Re-Rolling Industry

Applications for Licences Invited

The Government of India would like arrangements to be made from now onwards for developing the Steel Re-rolling Industry in the light of the growing demand for its products and the expected increase in the availability of raw materials (scrap and billets) during the next 5-year period. Government are making a comprehensive study of the raw material position. The indications are that supplies of billets in reasonable quantity are likely to be available towards the latter half of 1959.

Interested parties (including those whose applications for licences for re-rolling capacity have been turned down in the past) are requested to submit their applications for a licence under the Industries (Development and Regulation) Act to the Ministry of Commerce and Industry before June 15, 1956. Applications should be accompanied with details of plant and equipment proposed to be imported.

Ministry of Commerce and Industry,
New Delhi, April 11, 1956.

APPENDIX I (*b*)

Press Note, dated 6th June, 1956, issued by the Ministry of Commerce and Industry, Government of India.

PRESS INFORMATION BUREAU

GOVERNMENT OF INDIA

PRESS NOTE

Development of Steel Re-Rolling Industry

Policy regarding setting up of new units

In a Press Note issued on April 11, 1956, the Government of India announced that they would like arrangements to be made from now onwards for developing the Steel Re-rolling Industry during the next five-year period and invited applications from interested parties for a licence under the Industries (Development and Regulation) Act.

The Government of India feel that the attention of interested parties should be drawn to the revised Industrial Policy announced on April 30, 1956 in which, *inter alia*, stress has been laid on the dispersal of capacity wherever possible. As already indicated Government have also conducted a comprehensive review of the raw material position from which it is evident that new capacity cannot but be limited.

The Government feel that it would, therefore, be useful for applicants to bear in mind that in considering the licensing of new units Government will give preference to :

(*a*) locations in States where *no* capacity exists at all at present ; (*b*) the rolling of special and uncommon sections which are not being normally rolled in India. For example light angles and tees, hexagonal and octagonal bars and half rounds ; and (*c*) the utilisation of such qualities of scrap as are at present being rejected, and are being exported for the ultimate production of finished steel sections.

Ministry of Commerce and Industry,
New Delhi, June 6, 1956.

APPENDIX II

(Published in the Gazette of India, Extraordinary, dated the 24th July, 1956)

GOVERNMENT OF INDIA

MINISTRY OF COMMERCE AND INDUSTRY

New Delhi, dated the 24th July, 1956

RESOLUTION

No. I. & S. (B)-55(7)/56.—On the 11th April, 1956, the Government of India had through a Press Note invited applications from parties interested in the setting up of steel re-rolling mills in the country for consideration under the Industries (Development and Regulation Act). In a further Press Note it had been explained that in considering the licensing of new units the intention of Government was to give preference to :

(a) location in States without capacity at present ;

(b) capacity for rolling special and uncommon sections not normally rolled by the existing re-rolling mills ; and

(c) the utilisation of such scrap as is regarded as unusable in this country at present.

It is clearly desirable that the development of the steel re-rolling industry should be co-ordinated with the development that is taking place in other sectors. The position needs to be reviewed, having regard to the production programme of the primary producers of steel in the private and public sectors and the availability of raw materials. It is also the intention to examine at the same time the existing capacity of electric furnaces and foundries and the lines of their future development.

The Government of India have, therefore, decided to set up a Committee to consider the future lines of expansion of the steel re-rolling industry, as well as of electric furnaces and steel foundries. The composition of the Committee will be as follows :—

(1) Shri B. B. Saksena, Joint Secretary, Ministry of Commerce and Industry	Chairman.
(2) Shri S. Sambasivan, Tata Iron and Steel Co., Ltd. .	Member.
(3) Shri R. M. Agrawal, Mukand Iron and Steel Works, Ltd. Bombay	Member.
(4) Shri D. P. Dada, Shree Maharaja Steel Mills Ltd., Kapurthala	Member.
(5) Shri K. S. Raghupati, I.A.S., Deputy Secretary, Ministry of Iron and Steel	Member.
(6) Shri S. Banerjee, Deputy Iron and Steel Controller . .	Member-Secretary

The Committee will—

(a) study the raw material requirements of the existing electric furnaces, foundries and re-rolling mills in the country and assess the kind of expansion that is possible having regard to the availability of the raw materials in the future ;

(*b*) suggest ways and means of improving the efficiency of these units and recommend steps that should be taken to make them economic and independent of any form of subsidy in regard to the prices at which they obtain their raw materials ;

(*c*) assess the additional capacity that it may be desirable to set up in the light of the developments which are taking place in other sectors of the economy and the consideration set out in (*a*) and (*b*) above ;

(*d*) indicate suitable locations for the new units that may be set up having regard to the importance of promoting regional development and other relevant considerations such as transport facilities and raw materials supplies ; and

(*e*) formulate principles which should govern the examination of the applications for setting up re-rolling mills which have been received in response to the Press Note of the 11th April, 1956.

The Committee is requested to submit its report as early as possible and preferably by the end of September, 1956.

Ordered that a copy of the above Resolution be communicated to all State Governments, all Ministries of Government of India, Prime Minister's Secretariat, Cabinet Secretariat, Parliament Secretariat, the Private and Military Secretaries to the President, the Planning Commission, the Comptroller and Auditor General of India, the Accountant General, Central Revenues.

Development Wing, New Delhi.

Iron and Steel Controller, 33, Netaji Subhas Road, Calcutta.

The Steel Re-rolling Mills Association of India, 20, Strand Road, Calcutta.

Ordered also that it be published in the Gazette of India.

N. SUBRAHMANYAM,

Joint Secretary to the Government of India.

सत्यमेव जयते

APPENDIX III

1st October '56 to 3rd October, '56	(1) Meetings at Calcutta. (2) Visit to the scrap yard of M/S Grand Smithy Works, Belur. (3) Meeting with the representatives of the Steel Re-rolling Mills Association of India.
17th October '56	Meeting at Delhi.
25th October, '56	(*a*) Meeting at Bombay. (*b*) Meeting at Bombay with the Director of Industries, Government of Bombay. (*c*) Visits to the works of the following steel re-rolling mills : (1) M/S National Steel Works, Ltd., Bombay. (2) M/S Taj Iron and Steel Works, Ltd., Bombay. (3) M/S. Mukand Iron and Steel Works Ltd., Bombay. (4) M/s K. T. Rolling Mills, Ltd., Bombay. *(*d*) Visit to the scrap yard of the Central Railway at Haji Bunder.
14th November, '56	*Visit to the scrap yard of the South Eastern Railway at Kharagpur.
19th November, '56 and 20th November, '56	(*a*) Meeting at Calcutta. (*b*) Visits to the works of the following Steel Re-rolling Mills : (1) M/S Guest, Keen, Williams, Ltd., Calcutta. (2) M/S Bharatia Electric Steel Co., Ltd., Calcutta. (3) M/S Bengal Rolling Mills Ltd., Calcutta.
21st November, '56 and 22nd November, '56	(*a*) Visits to the works of the following : (1) M/S Tata Iron and Steel Co., Ltd., Jamshedpur. (2) M/S Indian Steel and Wire Products, Ltd., Jamshedpur. (3) M/S Indian Tube Co. (1953) Ltd., Jamshedpur. (4) M/S Tata Locomotive and Engineering Co. Ltd., Jamshedpur. (*b*) Meeting at Jamshedpur.
23rd November, '56	(*a*) Meeting at Patna. (*b*) Meeting with the Secretary, Industries Department and the Director of Industries, Government of Bihar, Patna. (*c*) Meeting with the Bihar Chamber of Commerce, Patna.
24th November, '56	*Visits to the workshops and scrap yard of the Eastern Railway at Jamalpur with District Controller of Stores, Eastern Railway, Jamalpur.

10th December, '56 and 11th December, '56	*(a) Visit to the Steel Foundry Shops of the following :— (1) M/S Bhartia Electric Steel Co., Ltd., Calcutta. (2) M/S Burn & Co., Howrah. *(b) Visit to the scrap yard of the Eastern Railway at Belur. *(c) Visit to the scrap yard of M/S Khemchand Rajkumar, Calcutta. *(d) Visits to loading points for export of scrap—barges and steamer.
12th December '56	Meeting at Delhi.
3rd January, '57 and 4th January, '57	(a) Meeting at Amritsar. (b) Meeting with Industrialists and Re-rollers at Amritsar. (c) Meeting with the Finance and Industries Minister, Punjab, and the Director of Industries, Government of Punjab at Batala. (d) Meeting with the representatives of the following :— (1) Industrialists of Jullundur. (2) Steel Re-rolling Mills of Gobindgarh. (3) Rehabilitated Industries Association, Jullundur. (4) Doaba Industries Association, Jullundur. (e) Visits to the works of the following steel re-rolling mills and/or industrial units :— (1) M/S Partap Steel Rolling Mills, Chheharta. (2) M/S Agarwal Steel Rolling Mills, Chheharta. (3) M/S Northern India Steel Works, Verka. (4) M/S G. D. Steel Rolling Mills, Batala. (5) M/S Batala Engineering Co., Ltd., Batala. (6) M/S Saraswati Steel Rolling Mills, Jullundur. (7) M/S Aeron Steel Rolling Mills, Jullundur. (8) M/S Shivchand Agarwal, Jullundur. (9) M/S Ludhiana Steel Rolling Mills, Ludhiana. (10) M/S Santram Ramji Dass Iron & Steel Rolling Mills, Gobindgarh. (11) M/S Ram Tirath Iron & Steel Re-rolling Mills, Gobindgarh. (12) M/S Khalsa Iron & Steel Re-rolling Mills, Gobindgarh. (13) M/S Milkhiram Hargopaldass Steel Rolling Mills, Gobindgarh. (14) M/S Modi Oil & General Mills, Gobindgarh. (f) Meeting at Gobindgarh.
23rd February, '57	*Visit to the works of the K. C. P., Ltd., Industrial Group, Madras.
24th February, '57	(a) Meeting at Negapatam. (b) Visit to the works of M/S Indian Steel Rolling Mills, Ltd., Negapatam.
25th February, '57	(a) Meeting at Ernakulam (Kerala) with the Joint Director of Industries, Government of Kerala and applicants for steel re-rolling mills.

	(*b*) Visit to the scrap yard of M/S Mather & Co., Ernakulam (manufacturer of agricultural implements etc.). (*c*) Visit to the works of M/S Brunton & Co., Engineers, Ltd., Cochin. (*d*) Meeting at Cochin (Ernakulam).
27th February '57	*Visits to the works of the following:— (1) M/S Fertilisers and Chemicals (Travancore), Alwaye. (2) M/S Indian Aluminium Co., Alwaye.
2nd March '57	*Visit to the works of the Mysore Iron and Steel Works, Bhadravati.
4th March, '57	*(*a*) Visit to the works of M/S Tube Products of India, Ltd., Madras (Avadi). *(*b*) Visit to the Integral Coach Factory, Madras (Perambur).
4th April, '57	*Meeting at Calcutta.
8th April, '57	Meeting at Delhi.
15th April, '57	(*a*) Meeting at Kanpur. (*b*) Meetings at Kanpur :— (1) With the Director of Industries, Government of U.P. (2) With the Merchants Chamber of Commerc Kanpur. (3) Representatives of the Registered Re-rollers of U.P. (4) Representatives of the Un-registered Re-rollers of U. P. (*c*) Visits to the works of the following Steel Re-rolling Mills :— (1) M/S Singh Engineering Works, Ltd., Kanpur. (2) M/S Jain Steel Rolling Mills, Kanpur. (3) M/S Cawnpore Rolling Mills (Private) Ltd., Kanpur. (4) M/S Radheylal Steel Rolling Mills, Kanpur.
24th April, '57	Final meeting at Calcutta.

*Indicates meetings or visits by a small section of the Committee.

APPENDIX IV (*a*)

Press Note issued by the Department of Supply, Government of India on 6th September, 1941.

NOTICE

To all concerned in the management of Steel Re-rolling Mills

The Government of India are revising their arrangements for the control and distribution of iron and steel scrap. They intend to work through a single trade Association, namely the Steel Re-rolling Mills Association of India. The proprietors of all Steel Re-rolling Mills in India started before the 1st September, 1941 are invited to become members of the Steel Re-rolling Mills Association on or before the 15th November, 1942 after which date a Committee of the Association to classify Re-rolling Mills for the purpose of the new scheme will be appointed. For further particulars apply to the General Secretary, The Steel Re-rolling Mills Association of India, 100, Clive Street, Calcutta.

Secretary,
Government of India,
Department of Supply,
New Delhi.

APPENDIX IV (*b*)

Press Note issued by the Department of Supply, Government of India, in October 1942

PRESS NOTE

Increasing Steel Supplies.
Better Facilities for Re-rolling Mills.
Government to avert Profitless Competition.

The Government of India have decided to invite all steel re-rolling mills in the country started before September 1, 1941, to enrol themselves as members of the Steel Re-rolling Mills Association on or before the 15th November, 1942.

2. This decision has been reached in order to provide equality of opportunity to mills started before September 1, 1941, to secure the efficient conversion of steel, to safeguard established mills as far as possible against a failure in the supply of scrap for and to avert profitless competition.

3. In a communique issued on Septembr 6, 1941, the Government of India expressed the view that the available scrap was scarecely enough to enable existing mills to carry on their normal business, and warned all concerned that in the event of the Government of India having to take special measures to regulate the supply of scrap to re-rolling mills and other users, they would not include any re-rolling mills started on or after September 1, 1941.

4. The Government of India have found it convenient to work through a single Trade Association. A Committee for the classification of all mills (old as well as new) which are or may become members of the Steel Re-rolling Mills Association on or before 15th November, 1942 will be appointed as soon after that date as possible. This Committee will consist of two representatives of Government and a representative elected by all the member-firms of the Association and will determine the classification of the mills according to their efficiency, convenience of location and transportation facilities, into categories A, B and C.

5. An endeavour will be made to supply scrap to mills in category A for two shift working and to category B for one shift working. Mills placed in category C will receive whatever is left after the requirements of mills in categories A and B has been supplied.

6. The rate of charge for conversion from scrap to steel will be fixed by agreement between the Government and the Association from time to time on a sliding scale, mills in category C getting the highest rate for conversion. The rates at which steel will be supplied to Government or sold and the other conditions will also be determined by agreement. The Re-rolling Mills will be obliged to dispose of the whole of their products in accordance with the instructions of the Iron and Steel Controller. Government also intend in the near future to control iron and steel scrap by statutory order and to fix maximum prices for all categories of scrap.

APPENDIX V

Note on the Equalisation Fund of the Iron and Steel Control, Calcutta

With the commencement of the Second World War and the consequent reduction of imports of steel, it was found necessary to introduce control over steel required for war as well as for civil purposes. A scheme was, therefore, introduced from 1-2-43 whereby an Average Equalised Price was fixed for steel whether imported or sold by the Main Producers of Steel (TISCO & IISCO) to the Controlled Stockholders.

The Average Equalised Price was generally higher than the commercial pricas of the Main Producers. A surcharge representing the difference between the Average Equalised Price ard Commercial Price was, therefore, recoverable from the Main Producers and credited to the Equilisation Fund of the Iron and Steel Controller in respect of despatches of steel by Main Producers. In the case of Re-rollers, the cost of production differed from one Re-roller to another and the Fund was debited or credited as the case may be, with the difference between the average Equalised Price and the Retention Prices admissible to each Re-roller on the basis of agreed conversion cost in respect of their despatches of steel.

As the prices of steel were fixed at F.O.R. Port Rate, an extra element called the 'Place Extra' on account of the railway freight was fixed for other stations and adjustments were made with the Main Producers and Re-rollers on account of the difference between the "Place Extras" realised and actual freight paid to Railways in respect of steel sold at F.O.R. destination rates.

From 1-7-44 a "single price scheme" was introduced superseding the "Average Equalised Price". Under this Scheme, steel of each category of steel was sold at the same rate by all Producers whether Main Producers or Re-rollers for war or civil purposes. Adjustment with the Main Producers and Re-rollers with the Fund, by debits or credit as the case might be, continued to be made on the basis of war contract rates and commercial rates of the Main Producers and the conversion cost of the different Re-rollers.

In January '48 it was decided that in order to supplement the quantity of indigenous steel which was inadequate to meet India's requirement, Steel should be imported from abroad and sold at the same price as indigenous steel, the high cost of import being subsidised from the Equalisation Fund. In order to provide for sufficient fund for this purpose the sale prices of steel were increased.

In September '52 the scope of the Fund was further enlarged to provide for granting interest free loan of Rs. 10 crores to each of the two Main Producers (TISCO & IISCO) in connection with their "Development and Expansion Programme". The Statutory Selling Prices were accordingly increased from 22-9-52 to allow for increased surcharge being collected from Main Producers for the above purpose. From 14-11-53 surcharge on Pig Iron is being collected with a view to enabling the Pig Iron produced by Mysore Iron and Steel Works being sold at a uniform price with the products of the other two Main Producers.

The Port price structure was abolished from 11-6-56 and uniform selling prices of steel at all rail head stations have been fixed from that date.

APPENDIX VI

Names and Addresses of Steel Re-rolling Mills

BIHAR

Secondary Producers

1. M/s. Eagle Rolling Mills Ltd. (Kumardhubi), Chartered Bank Bldgs., Calcutta.
2. M/s. Indian Steel and Wire Producers, Ltd. (Tatanagar), 7, Wellesly Place, Calcutta.

Un-Registered Re-Rollers

1. M/s. Gwalior Metal Industries (Patna), 1, Inner Circular Road, Jamshedpur.

BOMBAY

Registered Re-rollers

1. M/s. Krishna Steel Industries Private Ltd., 301, Msujid Bunder Road, Bombay-3.
2. M/s. Mukand Iron and Steel Works, Ltd., Bombay Agra Road, Kurla, Bombay.
3. M/s. Taj Iron and Steel Works, Private Ltd., 247, Ripon Road, Byculla, Bombay.

Un-Registered Re-rollers

1. M/s. B. R. Herman & Mohatta (I) Private Ltd., Peoples Bldg., Firozeshah Mehta Road, Fort, Bombay.
2. M/s. Ishardas Ramchand, Kriti Bldg., Forebes Street, Fort, Bombay.
3. M/s. K. T. Rolling Mills Private Ltd., Broach Street, Carnac Bunder, Bombay, Thana Dist.
4. M/s. Nav Bharat Steel Rolling Mills, C/o M/s. K. Parikh & Co., Iron Market, Carnac Bunder, Bombay-9.
5. M/s. National Industrial Corpn., Warden House (1st Floor), Sir Firozeshah Mehta Road, Fort, Bombay.
6. M/s. Punjab Steel Rolling Mills (Baroda), P. O. Chemical Industries, Baroda.
7. M/s. Sirdar Iron & Steel Mills, Agra Road, Vikhroli, Bombay.
8. M/s. Sulekh Ram & Sons, Steel Rolling Mills, 28, Vallabh Nagar, Odhav Road, Ahmedabad.
9. Steel Mills of India Ltd., 33, Netaji Subhas Road, Calcutta.
10. M/s. Bharat Iron and Steel Industries, Darukhana, Mazagaon, Bombay.
11. M/s. Bharat Iron & Steel Industries, Ruvapari Rd., Bhavnagar.
12. M/s. Saurashtra Industries Bunder Road, Bhavnagar.
13. M/s. Sharma Metal Rolling Mills, Bhavnagar, Bombay.
14. M/s. Sewree Iron & Steel Co., Plot No. 6, Sewree Cross Road, Sewree, Bombay-15.
15. M/s. National Steel Works Ltd., Warden House (1st Flr), Sir Firozeshah Mehta Road, Fort, Bombay.

DELHI

Registered Re-rollers

1. M/s. Steel & General Mills Co., Ltd., 3 Cavalry Lines, Delhi-8.

Un-Registered Re-rollers

1. M/s. Delhi Steel Rolling Mills, C/o M/s. Rameshwar Dass, Ram Chander, Katra Nawab Saheb, Chandni Chowk, Delhi.
2. M/s. Mahabir Steel Rolling Mills, 32, Hanuman Road, New Delhi.

3. M/s. Rathi Steel Rolling Mills, Katra Rathi, Egerton Road, Delhi.
4. M/s. Seth Munnalal Steel Rolling Mills, Loni Road, Shahdara, Delhi.
5. M/s. Sudarshan Steel Rolling Mills, G. T. Road, Shahdara, Delhi.

MADRAS

Secondary Producers

1. M/s. Indian Steel Rolling Mills, Ltd., Oriental Bldgs., Armenian St., G. T. Madras.

Registered Re-rollers

1. M/s. Sri Rama Machinery Corporation Ltd., Sundar Mahal, 55, Peters Rd., Cathedral P.O., Madras 6.

Un-Registered Re-rollers

1. M/s. Rama Krishna Steel Rolling Mills, C/o M/s. Rama Krishna Kulwant Rai, 33, Sembudoss St., Madras.

MADHYA PRADESH

Un-Registered Re-Rollers

1. M/s. Bhandari Iron & Steel Co., 518, Silnath Camp, Indore.
2. M/s. Central India Iron & Steel Co., 517, Silnath Camp, Indore.
3. M/s. Baroda Steels, Ltd. (Barwaha, M.P.), 58, Luxmi Bldgs., Sir F. M. Road, Fort, Bombay.
4. M/s. Digvijoy Industries, Ltd., Bangrod, Dt. Ratlam.
5. M/s. Indore Steel & Iron Mills, Indore City.

ORISSA

Un-Registered Re-rollers

1. M/s. National Foundry and Rolling Mills, Ltd., Nayabazar, Cuttack-4.

PUNJAB

Registered Re-rollers

1. M/s. Batala Engineering Co., Ltd., Batala, Punjab.
2. M/s. Lauls Private, Ltd., Faridabad Township, Dt. Gurgaon, Punjab.
3. M/s. Partap Steel Rolling Mills, Chehharta.

Un-Registered Re-rollers

1. M/s. Agarwal Steel Rolling Mills Akali Market, Amritsar.
2. Acorn Steel Rolling Mills, Jullundur City.
3. M/s. C. L. Monga & Sons, Industrial Area, Panipat.
4. M/s. Deshraj Chiranjilal Iron Rolling Mills, Khanna, Ludhiana.
5. M/s. Ganga Steel Rolling Mills, Millergunge, Ludhiana.
6. M/s. Ludhiana Steel Rolling Mills, Millergunge, Ludhiana.
7. M/s. Mukundamall Ramdittamall Steel Rolling Mills, Industrial Area, Jamuna Nagar, Jagadhri, Rly. Station.
8. M/s. Shiv Chand Aggarwal, Jullundur City.
9. Saraswati Steel Rolling Mills, Jullundur City.
10. M/s. Sree Gurunanik Steel Rolling Mills, Tanda Road, Jullundur.
11. M/s. Chiranjilal Steel Rolling Mills, Patiala, Punjab.
12. M/s. Gopal Iron & Steel Works, Amloh Road, Gobindgarh, Punjab.
13. M/s. Gainda Mal Handa & Sons, G. T. Road, Phagwara, Punjab.
14. M/s. Iron Factory, Gobindgarh, Punjab.

15. M/s. Jain Steel Rolling Mills, Talkatora Road, Malerkotla, Punjab.
16. M/s. Malawa Ram Handa & Sons, G. T. Road, Phagwara, Punjab.
17. M/s. Meta Bros., Sirhind, Patiala, Punjab.
18. M/s. National Steel & Rolling Mills, Mandi Gobindgarh, Punjab.
19. M/s. Panesar Iron Rolling Mills, Gobindgarh, Punjab.
20. M/s. Sawanmal Shibumal, Dhuri, Patiala, Punjab.
21. M/s. G. D. Steel Rolling Mills, Batala, Punjab (I).
22. M/s. S. Santokh Singh Gurmukh Singh Steel Rolling Mills, Jaura-Pipal, Dt. Amritsar.
23. M/s. Ajit Cotton Ginning Pressing Dal & Steel Rolling Mills, Ram Pura Phul, Punjab.
24. M/s. B. S. & Brothers Steel Rolling Mills, Ahmedgarh, Punjab.
25. M/s. Steel Sales (India) Private Ltd., Tanda Road, Jullundur City.
26. M/s. Balu Ram Harman Dass Steel Rolling Mills, Gobindgarh, Punjab.
27. M/s. Ch. Dewan Chand Dhanpatrai Bhatia, G. T. Road, Gobindgarh, Punjab.
28. M/s. Devgan Iron Rolling Mills, Mandi Gobindgarh, Punjab.
29. M/s. Gopal Mills, Mandi Gobindgarh, Punjab.
30. M/s. Goel Steel Rolling Mills, Jaitu, Punjab.
31. M/s. Gangaram Assaram Iron & Steel Rolling Mills, Gobindgarh, Punjab.
32. M/s. Hira Singh Bazura Singh Rolling Mills, Gobindgarh, Punjab.
33. M/s. Jora Mal & Sons Iron & Steel Rolling Mills, Phagwara, Punjab.
34. M/s. Jagatjit Industrial Corporation, Kapurthala, Punjab.
35. M/s. Jindal Steel Works, Malerkotla, Punjab.
36. M/s. Khalsa Iron & Steel Re-rolling Mills, Mandi Gobindgarh, Punjab.
37. M/s. Luxmi Steel Rolling Mills, Jaitu, Nabha State, Punjab.
38. M/s. Mangat Industries, Doraha, Patiala State, Punjab.
39. M/s. Malli Steel Rolling Mills, G. T. Road, Phagwara.
40. M/s. Modi Oil & General Mills, Gobindgarh, Punjab.
41. M/s. Mulkhiram Har Gopal Das Steel Rolling Mills, Jaitu, Nabha State, Punjab.
42. M/s. National Engineering Co., Ltd., Industrial Area, Kapurthala.
43. M/s. Narankari Iron Rolling Mills, Mandi Gobindgarh.
44. M/s. Punjab Steel Rolling Mills, Nabha Road, Gobindgarh, Punjab.
45. M/s. Pritam Singh Hunjan & Bros. Iron & Steel Rolling & Oil Mills, Sunam (Dt. Sangrur), Punjab.
46. M/s. Rama Steel Rolling Mills, Mandi Gobindgarh, Punjab.
47. M/s. Ram Tirath Iron & Steel Re-rolling Mills, Mandi Gobindgarh, Punjab.
48. M/s. Santram Ramji Dass Iron & Steel Rolling Mills, Mandi Gobindgarh, Punjab.
49. M/s. Saraswati Steel Rolling Mills, Gobindgarh, Punjab.
50. M/s. Shree Maharaja Steel Mills Private Ltd., Kapurthala, Punjab.
51. M/s. Sulekh Ram Banarasi Das Steel Rolling Mills, Mandi Gobindgarh, Puniab.
52. M/s. Vishivkarma Steel Rolling Mills, Mandi Gobindgarh, Punjab.

RAJASTHAN

Registered Re-Rollers

1. M/s. Man Industrial Corporation Ltd., Jaipur.

Un-Registered Re-rollers

1. M/s. Jaipur Metals & Electricals Private Ltd., Jaipur.
2. M/s. Guru Nanak Steel Rolling Mills, Bharatpur, Rajasthan.
3. M/s. Rajasthan Iron & Steel Rolling Mills, P. O. Ram, Jodhpur, Rajasthan.
4. M/s. Bansiwala Iron & Steel Rolling Mills, Adarsha Nagar, Ajmer.

UTTAR PRADESH

Registered Re-rollers

1. M/s. Cawnpore Rolling Mills, Ltd., Harrisganj, Kanpur.
2. M/s. J. K. Iron & Steel Co., Ltd., Kamla Tower, Kanpur.
3. M/s. Prakash Engg. Co., & Rolling Mills, Freeganj, Agra City.
4. M/s. Singh Engg. Works Private Ltd., Kanpur.
5. M/s. Delhi Iron & Steel Co., Private Ltd., G. T. Road, Gaziabad.

Un-Registered Re-rollers.

1. M/s. Agarwal Iron Works and Steel Rolling Mills, Moti Lal Nehru Road, Agra.
2. M/s. Benares Steel Rolling Co., Chowka Ghat, Benaras.
3. M/s. Bindeswari Prasad Banwarilal Steel Rolling Mills, Ghumni Bazar, Kanpur.
4. M/s. Indian Rolling Mills, Fazalgunj, Kanpur.
5. M/s. Jain Steel Rolling Mills, Deputy-ka-Parao, Kanpur.
6. M/s. Jhansi Iron & Steel Rolling Mills Co., Civil Lines, Jhansi.
7. M/s. Jagdish Rolling Works, 93A, Factory Area, Fazalganj, Kanpur.
8. M/s. Kashi Iron Foundry, Benaras.
9. M/s. Cawnpore Plate Mills Private, Ltd., Kanpur.
10. M/s. Radheylal Steel Rolling Mills, Rajgaddi Hatia, Kanpur.
11. M/s. Singh Plate Mills Private Ltd., Kanpur.
12. M/s. Shree Lakshman Rolling Mills, 359, Harrisganj, Kanpur.
13. M/s. Sree Ram Rolling Mills, C/o Punjab Iron & Electrical Works, Aisbagh, Lucknow.
14. M/s. Shree Mahabir Rolling Mills, Kanpur.
15. M/s. U. P. Rolling Mills Co., Private Ltd., Coopergunge, Kanpur.
16. M/s. Kisaan Engg. Works Private Ltd., 19, G. T. Road, Ghaziabad.
17. M/s. Modern Industries, Sahibabad (Ghaziabad), Dt. Meerut.
18. M/s. S. Atma Singh Steel Rolling Mills, Factory Area, Kanpur.

WEST BENGAL

Secondary Producers

1. M/s. Guest, Keen, Williams Ltd., 41, Chowringhee Road, Calcutta.

Registered Re-rollers

1. M/s. Bhartia Electric Steel Co., Ltd., 42, Shibtela St., Calcutta.
2. M/s. Bhartia Steel & Engineering Co. Private Ltd., 61, Keshab Sen St., Calcutta.
3. M/s. Bombay Steel Rolling Mills Ltd., 33, Netaji Subhas Road, Calcutta.
4. M/s. Hindustan Iron & Steel Co., 8, Rajendra Deb Road, Calcutta.
5. M/s. National Iron & Steel Co., Ltd., Stephen House, 4 Dalhousie Square East, Calcutta.
6. M/s. National Rolling & Steel Ropes, Ltd., Stephen House, 4, Dalhousie Sq. East, Calcutta.
7. M/s. J. K. Steel Ltd., 7, Council House Street, Calcutta.

Un-Registered Re-rollers

1. M/s. Aggarwal Hardware Works, Ltd., 167, Chittaranjan Avenue, Calcutta.
2. M/s. Bengal Rolling Mills, Ltd., 67/B, Netaji Subhas Road, Calcutta.
3. M/s. Chaliha Rolling Mills 13, Chanditola Lane (Russa), Tollygunge, Calcutta.
4. M/s. Calcutta Iron, Steel & Non-Ferrous Metal Works, 22, Canning Street, Calcutta (Room No. 11).

5. M/s. Keshav Rolling Mills, 20, Tarachand Dutt St., Calcutta.
6. M/s. Lillooah Steel & Wire Co., Private Ltd., 16, Belur Road, Howrah.
7. M/s. Orient Iron & Steel Co., Private Ltd., 3, Height Road, Lillooah, Howrah.
8. M/s. Rama Rolling Mills, 156, Manicktola Main Road, Calcutta.
9. M/s. Sun Rolling Mills Private Ltd., 8, Chornwallis St., Calcutta.
10. M/s. Swadeshi Industries, Ltd., 33, Netaji Subhas Road, Calcutta.
11. M/s. Shree Bajrang Electric Steel Co., Ltd., 83, Old Chinabazar St., Calcutta.
12. M/s. Steel Equipment & Construction Ltd., 22, G. T. Road (North), Lillooah, Howrah.
13. M/s. Shree Laxmi Iron & Steel Works, Private Ltd., P/16, Kalakar Street, Calcutta.
14. M/s. Shree Hanuman Steel Rolling Mills Co., Ltd., 62/D/2, Jogendra Nath Mukherjee Road, Ghusuri, Howrah.
15. M/s. Sri Durga Rolling Mills 197/1, G.T. Road, Ghusuri, Howrah.
16. M/s. Steel Rolling Mills of Bengal Ltd., 33, Netaji Subhas Road, Calcutta.
17. M/s. Steel Rolling Mills of Hindusthan Ltd., 135, Canning Street, Calcutta.
18. M/s. United Rolling Mills Private Ltd., 160, Girish Ghosh Road, P. O. Belur Math, Howrah.
19. M/s. British India Rolling Mills, 23, Canal West Road, Calcutta.
20. M/s. Dass Steel Industries of India, 19, Maharshi Devendra Road, Calcutta-7.

APPENDIX VII

Note on Cols. I, II and III Rates for controlled categories of Prime Steel

Controlled categories of steel can be sold by 3 classes of suppliers :

(*a*) Registered Producers.

(*b*) Controlled Stockholders.

(*c*) Registered Stockholders.

2. *Col. I Rate.*—The maximum price at which a Registered Producer can sell steel is called the Col. I rate. This rate is lower than the rates at which the other 2 classes of suppliers are permitted to sell because the other two have extra remuneration for carrying the material in stock and retailing it.

3. *Col. II Rate.*—The maximum price at which the controlled stock-holders are permitted to sell is called the Col. II rate. These Controlled Stockholders are appointed by the Central Government for catering to piecemeal and retail demands which due to the pattern of production of the producers cannot be assembled together with facility. These supplies are against Quota Certificate issued by the Government. For stocking the materials and supplying them, the Controlled Stockholders receive a remuneration of Rs. 30 per ton for untested materials and Rs. 35 per ton for tested materials.

4. *Col. III Rate.*—is the maximum rate at which all persons other than Registered Producers and Controlled Stockholders are allowed to sell materials. In this class, Government has appointed Registered Stockholders who are different from the Controlled Stockholders and Registered Producers. The Registered Stockholders have to supply steel against permits issued by the State Government and not against quota certificates of the Central Government. They supply to the relatively small consumers and piecemeal agricultural demands of the State. Such supplies are on a smaller scale and of a more retail nature. For this they receive a remuneration of Rs. 45 per ton over the Col. I rate. Their maximum selling rate is called the Col. III rate. All Un-registered Re-rollers have been permitted to function as Registered Stockholders and the maximum selling price at which they can sell materials rolled from alloted scrap is at Col. III rates. Such stock is operated on by the State Government Authorities who issue permits on them.

APPENDIX VIII

Questionnaire for Registered and Un-Registered Re-Rollers to Assess their Production Capacity

Name and Official address :

Telegraphic address :

Telephone Number :

Factory address :

NOTE.—The information you give in reply to any of the questions must be as full and as accurate as possible. You must be prepared to substantiate all your statements by proof and proper arguments when required by the Government to do so. No points outside the scope of this enquiry should be brought in your replies. Please note that all your replies will be carefully scrutinised by experts which the Government intends to appoint for the purpose.

1. Submit a complete and detailed lay-out of the mill.

2. *Monthly capacity on basis of one shift of eight hours.*

   (a) What is the present capacity as assessed by the Iron & Steel Controller ?

   (b) What is the present capacity created with the sanction of the Iron & Steel Controller ?

   Please give date of sanction.

   (c) What is the present capacity created without the sanction of the Iron & Steel Controller ?

   (d) What is the capacity proposed to be created ?

   (e) What are your development plans, if any, corresponding to any application already made by you to Government ?

3. When were the mills installed ?

4. *Railway facilities* :

   (a) Length of track inside the plant. .
   (b) Distance of plant from the Railway Station . . . .

5. *Power Supply* :

   (a) Source.
   (b) Amount available . . . . .
   (c) Is this sufficient ? If not, state reason

6. *Fuel Supply* :

   (a) Source . . . .
   (b) Amount available . . . . .
   (c) Is this sufficient ? If not, state reason ?

7. Number of shifts/day mill operates .
8. State details of any alteration or extension made to mills within the last 4 years.
9. State details of any additional equipment on order . . . . .
10. *Proposal for additions, alteration or expension* :
    (*a*) Brief details—size and number of stands and motor H.P.
    (*b*) If finance, land, power and other facilities available.
    (*c*) Capacity expected after expansion .
    (*d*) Proposed sections and sizes of finished products after expansion.
11. *Technical advice* :—
    Is it available for future development plans, if so, state source ?
12. Do you anticipate any difficulties in your development programmes ?
13. *Steel-making facilities* :—
    State if available
    (*a*) Type of furnaces and capacities .
    (*b*) Any future plans for expansion or installation.
14. State any other points that may help the Government in re-assessing your capacity.

Particulars	Mill No 1	Mill No. 2	Mill No. 3

15. *Type of Mill* :
    (*a*) Size.
    (*b*) No. of Stands 3—high
    2—high
    (*c*) Mill Speeds.
16. *Type of Drive* :
    (*a*) Electric, steam or diesel.
    (*b*) Direct, coupling, reduction gear, belt drive.
17. *Mill Motors* :
    (*a*) Horse-Power of motor.
    (*b*) A.C. or D.C.
    (*c*) R.P.M. (Speed)
    (*d*) Speed Range.
18. *Mill Auxiliaries* :
    (*a*) Repeaters.
    (*b*) Looping Arrangements.
    (*c*) Coilers—Capacity
    Max. weight of coil.
    (*d*) Shears—Capacity.
19. *Cooling Bed* :
    (*a*) Type.
    (*b*) Size of Bed.
    (*c*) Method of operation.

Particulars	Mill No. 1	Mill No. 2	Mill No. 3
(*d*) Type of dividing shear.			
(*e*) Maximum length of rolled product.			
20. *Raw Material* :			
(*a*) Scrap type.			
(*b*) Billet size.			
(*c*) Ingot size.			
21. *Rolls*			
(*a*) Material.			
(*b*) Initial Diam.			
(*c*) Barrel Length.			
Stand 1			
,, 2			
,, 3			
,, 4			
,, 5			
22. *Type of mill bearings* :			
23. *Range of product sizes in the following categories* :			
(*a*) Rods.			
(*b*) Bars.			
(*c*) Flats.			
(*d*) Squares.			
(*e*) Angles.			
(*f*) Tees.			
(*g*) Channels.			
(*h*) Hoops.			
(*i*) Any other sections such as sash and casement, etc.			
(In each case state maximum and minimum sizes).			
24. (*a*) *Number of passes from* 2·1/2″ × 2·1/2″ *billet to 5/8″ round* :			
Stand 1			
,, 2			
,, 3			
,, 4			
,, 5			
(*b*) *Number of passes from 2″ × 2″ billet to 3/8″ round* :			
Stand 1			
,, 2			
,, 3			
,, 4			
,, 5			
(*c*) *Number of passes from suitable re-rollable scrap to 3/8″ round* : (State type & size of scrap).			
Stand 1			
,, 2			
,, 3			
,, 4			
,, 5			

Particulars	Mill No. 1	Mill No. 2	Mill No. 3
25. *Production per hour of representative sections* :			
From Billets.			
(*a*) 2″ billet to 1/4″ round.			
(*b*) 2·1/2″ billet to 3/8 round.			
(*c*) 2·1/2″ billet to 1/2″ round.			
(*d*) 2·1/2″ billet to 5/8″ round.			
From re-rollable scrap.			
(*a*) To 1/4″ round.			
(*b*) To 3/8″ round.			
(*c*) To 1/2″ round.			
(State type & size of scrap against each product).			
26. Rest production figures :			
Per shift			
Per week			
Per month.			
(stating sections rolled and No. of shifts operated).			
27. Monthly production figures for last six months (stating sections rolled and No. of shifts operated).			
28. *Furnaces* (*Re-heating*) :			
(*a*) No. of furnaces.			
(*b*) Type of furnaces.			
(*c*) Capacity in tons per hour.			
(*d*) Furnace size (inside dimension).			
(*e*) Maximum billet size.			
(*f*) Billet charging method.			
(*g*) Billet discharging method.			
(*h*) Type of fuel.			
(*i*) Fuel consumption :			
(*i*) Per 8 hour shift.			
(*ii*) Per ton of product.			
(*j*) Method of firing.			
(*k*) Furnace down time/shift.			
29. *Raw Material Handling and Preparation.*			
(*a*) Billet cutting machine if any.			
Capacity			
Horse-Power.			
(*b*) Approximate billet storage area.			
(*c*) Crane type, size and capacity.			
(*d*) Any other mechanical aid.			
30. *Finished Product Handling* :			
(*a*) Maximum area for storage.			
(*b*) Crane type and capacity.			
(*c*) Any other mechanical aid, such as, rollers.			

Particulars	Mill No. 1	Mill No. 2	Mill No. 3
31. *Roll Turning equipment* :			
(*a*) Lathes.			
Number.			
Size.			
Type.			
(*b*) *Milling Machines* :			
Number.			
Size.			
Type.			

NOTE :—All answers to be typed on this form and four copies returned to the Iron and Steel Controller. If the space on this form does not suffice, additional sheets may be attached with the answers typed on them.

APPENDIX IX

Note on Unauthorised Re-rolling Capacity

Typical instances of unauthorised capacity are :—

(*a*) Where a re-roller obtained the permission of the Iron and Steel Controller to import or otherwise secure, plant and machinery on the plea of replacement but has not discarded the original plant, the capacity of the original plant should be treated as unauthorised.

(*b*) Where a party has secured plant and machinery to establish a new unit or to expand the existing capacity without the permission of the Iron and Steel Controller or any other competent authority, the capacity of such plant and machinery should be treated as unauthorised.

(*c*) Where two or more units have pooled their quotas of raw materials and are utilising the same in one unit only and that unit has in consequence increased its original capacity, the increase should be reckoned as unauthorised.

(It may be noted that in cases where a unit is modernised with the sanction of the competent authority and as a result of modernisation, its capacity is incidentally increased, no part of the increased capacity need be treated as 'unauthorised'.)

APPENDIX X

List of Special Sections

Sections	*Sizes (in inches)*
1. Beams and Channels	4 × 1·3/4, 3 × 1·1/2, 4×2, 1·5/8 × ·1/4 × 1/4, 2×1, Gate channel sections.
2. Sash, casement & Door frame sections	Various sizes in demand for these industries.
3. Special Sections for furniture making	Ditto.
4. Tees	3/4 × 3/4 × 1/8 to 2 × 2 × 1/4 rising by 1/8″.
5. Bars and Rods	Limit bars for bolts, nuts and rivets.
6. Flats	Light flats—width upto 2·1/2″ Thickness 1/8″ to 1/4″ rising by 1/16″.
7. Nut flats	Various sizes.
8. Spring Steel Sections	Ditto.
9. Deformed bars	1/4″ to 3/4″.
10. Hexagonal bars	3/8″ to 1·1/4″.
11. Octagonal bars	3/8″ to 1·1/2″.
12. Patented Wire	Various gauges.
13. Half rounds	Various sizes.
14. Bearing Plates	For 60 lbs. and 50 lbs. rails.
15. Fish plates for light rails	For 18 lbs., 20 lbs., 24 lbs., and 30 lbs., rails.
16. Angles	3/4 × 3/4 × 1/8 to 2 × 2 × 1/4 rising by 1/16″.

N. B.—All the above sizes have been given in inches, but equivalent or almost equivalent metric sizes should be kept in view.

APPENDIX XI

Statement showing the position of Re-rolling Capacity in various States by 1960-61

(In tons)

Sl. No.	States	Existing steel allocations under Heads involving significant proportions of re-rolled sections (percentages of total)	Estimated annual demand by 1960-61 to be met by "pure" re-rollers (other than main and Secondary Producers)	Existing re-rolling capacity on 2 shift basis (general practice in the Industry for economic operation) No. of units given in brackets	Difference between Col. 4 & 5 Surplus (+) Deficit (—)	Annual additional capacity of plant and machinery on order (not yet installed) on 2 shift basis. No. of units given in brackets	Total annual existing and projected re-rolling capacity on 2 shift basis Col. 5+7	Difference between ultimate capacity and demand Surplus(+) Deficit(—)
1	2	3	4	5	6	7	8	9
1.	Andhra	5·67	31,752	..	(—) 31,752	4,000 (1)	4,000	(—) 27,752
2.	Assam, Manipur, Tripura, N.E.F.A.	2·33	13,048	..	(—) 13,048	..	..	(—) 13,048
3.	Bihar	5·16	28,896	1,080 (1)	(—) 27,816	..	1,080	(—) 27,816
4.	Bombay	16·88	94,528	195,480 (18)	(+) 100,952	..	195,480	(+) 100,952
5.	Delhi	3·74	20,944	37,920 (6)	(+) 16,976	9,600 (1)	47,520	(+) 26,576
6.	Himachal Pradesh	0·17	952	..	(—) 952	..	..	(—) 952
7.	Jammu and Kashmir . .	0·74	4,144	..	(—) 4,144	..	..	(—) 4,144
8.	Madras, Pondicherry . . .	7·71	43,176	15,840 (2)	(—) 27,336	16,960 (2)	32,800	(—) 10,376
9.	Madhya Pradesh . . .	9·57	53,592	28,560 (5)	(—) 25,032	..	28,560	(—) 25,032
10.	Mysore	3·54	19,824	..	(—) 19,824	..	..	(—) 19,824
11.	Kerala	2·29	12,824	..	(—) 12,824	..	..	(—) 12,824
12.	Orissa	3·25	18,200	7,200 (1)	(—) 11,000	..	7,200	(—) 11,000
13.	Punjab	9·80	54,880	283,600 (55)	(+) 228,720	35,520 (3)	319,120	(+) 264,240
14.	Rajasthan	2·32	12,992	26,400 (5)	(+) 13,408	..	26,400	(+) 13,408
15.	Uttar Pradesh	13·46	75,376	177,440 (23)	(+) 102,064	21,600 (2)	199,040	(+) 123,664
16.	West Bengal, Andaman and other Islands.	13·32	74,592	455,880 (27)	(+) 381,288	86,640 (8)	542,520	(+) 467,928
	TOTAL . .	99·95 (Say 100%)	559,720 (Say 560,000)	1,229,400	(+) 669,680	174,320	1,403,720	(+) 844,000

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